

structures of participation in digital culture

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SOCIAL SCIENCE RESEARCH COUNCIL

Digital technologies have been engines of cultural innovation, from the virtualization of group networks and social identities to the digital convergence of textural and audio-visual media. User-centered content production, from Wikipedia to YouTube to Open Source, has become the emblem of this transformation, but the changes run deeper and wider than these novel organizational forms. Digital culture is also about the transformation of what it means to be a creator within a vast and growing reservoir of media, data, computational power, and communicative possibilities. We have few tools and models for understanding the power of databases, network representations, filtering techniques, digital rights management, and the other new architectures of agency and control. We have fewer accounts of how these new capacities transform our shared cultures, our understanding of them, and our capacities to act within them. Advancing that account is the goal of this volume.

STRUCTURES OF PARTICIPATION IN DIGITAL CULTURE

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1 Presentation

Joe Karaganis

Digital technologies are powerful catalysts of cultural change—this is a trivial observation in our present circumstances. The past decade has seen cultural innovation on a massive scale, from the virtualization of group networks and social identities to the digital convergence of text and audiovisual media. Although it is tempting to see technological change as an independent driver of this process, there is powerful reciprocity at work: New technologies take hold only in the context of accompanying cultural innovation as their latent possibilities are explored. This interdependence means that technologies are not merely received but, through processes of adoption, socially defined and, eventually, socially embedded in new collective and institutional practices. Social construction, in turn, feeds back into processes of technical innovation, shaping research priorities and design. In the end there is no simple causality: no chickens, no eggs.

Although this observation has deep roots in technology and media scholarship, the creative dimension of these sociotechnical encounters has not always been readily visible. A post-WWII generation of media scholarship, especially, consolidated around the idea that sociotechnical encounters ran one way: that the culture that mattered was mass culture, and that the media technologies that defined it were tools for controlling information and opinion.[1] Such perspectives were grounded in early experiences with the broadcast media, which privileged—even if they never fully realized—a model of centralized production and "passive" consumption that cast individuals as consumers, rather than as participants in culture or as citizens. By the 1980s and 1990s, a newer generation of scholarship had rehabilitated these sociotechnical encounters on a number of fronts, finding creative dimensions in reader and audience experience, in unpredictable user and consumer appropriation, and ultimately in challenges to the broader instrumental terms in which we think about the boundaries between persons and technological artifacts.

Today, such perspectives are increasingly mainstream, grounded not primarily in academic theory but in new, online, large-scale collaborative practices. In a few short years, open source software production and social Internet applications like Napster, Wikipedia, and YouTube have created digital media communities with millions of participants, for whom sharp distinctions between production, distribution, and consumption no longer map to everyday experience. Such platforms, in turn, have become touchstones for a wave of accounts of digital culture that emphasize its participatory dynamics

and, sometimes as a corollary, the obsolescence or at least discomfiture of older cultural industries. This perspective shift has been sharpened by the seemingly endless series of high-profile conflicts between new and old cultural intermediaries: YouTube versus media companies, Wikipedia versus traditional encyclopedias, Napster (or Grokster or iTunes) versus the recording companies, or Google versus publishers, to name only a few. These conflicts have highlighted the social and legal construction of digital culture in ways that, for older technologies, were comparatively settled or slow moving. In a few short years the convergence of experiential critique, institutional conflict, and new intellectual entrepreneurship has fostered an explicit and often contentious public debate about the organization of culture and the nature of cultural authority in the digital era. This book is part of that debate.

Because legal conflicts between new and old culture industries receive a lot of media attention, and because their outcomes can have sudden impacts on user communities, it has become conventional to view these as the main dramas in digital culture. But legal battles are, almost by definition, the most condensed and formalized moments of cultural change. There are vast new areas of social practice, creativity, and subjectivity that rarely cross the threshold of visibility to law, or that are oblique to it in important respects—the everyday practices of community making in online worlds provide an example, or the role that search engines play in organizing human experience. Others reside in the gray areas where law lacks effective or (sometimes) conceptual reach, such as the vast transnational copy culture that shadows global media.

This diversity of practices is magnified by the global diversity of cultures and states. Cultural change is never frictionless, uniform, or isolated in its effects. In contrast to some early views of the social impact of information technology, we do not live in an increasingly smooth, homogenized global digital culture, but rather in a lumpy one that facilitates some kinds of mobility, social networking, and representations of the world while marginalizing others. No one would dispute, for example, that electronic communication has brought the privileged citizens of global cities into closer contact. But its impact on the social distance between financial districts and poor neighborhoods *within* cities is less clear. No one doubts that search engines provide powerful new representations of the world that allow people to leverage more information than before, but those representations also compete with and transform other social technologies for visualizing, navigating, and

understanding the world, from the local library to the spatial concentration of commercial districts. Digital technologies are powerful forces of *deterritorialization*—of disembedding knowledge and culture from existing institutions, practices, and geographies—but they are also tools of continuous social and political *reterritorialization*, as borders are redrawn, new institutions and structures emerge, and new forms of control are established.

Structures of Participation in Digital Culture does not offer a singular account of this process, but rather a collective (and inevitably diverse) effort to bring these patterns, roles, forms of power, and opportunities for creative practice into sharper focus. The book's title emphasizes our shared view that the contemporary role of research is not just to assert or rehearse the new forms of cultural agency, but also to understand their production at the intersection of changing institutions, practices, and forms of subjectivity—to analyze their underlying "structures of participation," in other words. Our focus on practices—on the things people do with and in relation to new technologies—provides an empirical contribution to discussions that are often dominated by legal and technology scholarship and by their disciplinary strengths and weaknesses. Our volume offers a shift in perspective, not avoiding law and technology but displacing them so that we can see other features of our rapidly changing digital culture.

In our volume, this terrain includes emergent forms of personal agency and authority, from our changing relationship with the digitally mediated past, to the expanded scale of interpersonal networks, to the emergence of new systems of trust and credentialization. It includes new powers for surveillance and for tacit, system-level control of behavior exercised by corporate actors and states. It includes the roles that different technical architectures play in conditioning and distributing these new forms of power, authority, and sociability. It requires, finally, attention to the differential effects of flows of information, culture, and technology around the world, as these interact with patterns of structural inequality and distinctive social histories. The interplay between these registers is the recurrent subject of this volume—its central and enormously rich sociotechnical encounter.

The volume is loosely divided into three sections dedicated, respectively, to (1) looking at digital convergence as a process that transforms history, subjectivity, and global media flows; (2) exploring the richness and complexity of user practices in relation to the new social technologies; and (3) reconnecting these themes to questions of law, technical architectures,

and corporate power. The volume is further divided into "dialogues" between several of the longer chapters and shorter companion pieces. The short pieces offer counterpoints to or, more often, recontextualizations of the themes in the longer chapters, designed to deepen and extend our collective inquiry. More than just a record of this conversation, the pairings reflect the authors' commitment to a pluralistic and interdisciplinary form of inquiry into digital culture, and to the testing of problems across different geographies, perspectives, and methods.

Part I, "Alternative Geographies," offers a different set of starting points for a conversation about digital culture and emerging cultural intermediaries. The first two contributions, by Geoffrey C. Bowker (Chapter 2) and Gregory Crane (Chapter 3), explore the effects of what Bowker calls "the databasing of the world" on our relationship to the personal and collective past. Bowker asks what happens as databases introduce a "regime of memory" that is more flexible and comprehensive than that of the era of paper records. He characterizes this new regime as the era of "potential" memory—of a ubiquitous, constantly expanding, and infinitely configurable archive divorced from the spatially-anchored technologies of museums, libraries, or monuments—so many *lieux de mémoire*. Crane draws out two further consequences of this deterritorialization: the diffusion of the library back into its spatial referents, as location-based technologies permit the historical record to be remapped onto places themselves, and the (complementary) growth of responsive learning tools (talking books) that can maximize our finite capacities to search and experience the human record.

Ravi Sundaram (Chapter 4) and Brian Larkin (Chapter 5) transpose this concept of a virtualized culture archive to contexts in which the modernist social compact and its technological ambitions no longer hold—here India and Nigeria, but by extension many other developing world settings as well. They describe the fraying of a social and political order rooted in a narrative of modernization and rationalization of urban life. In these contexts, digital culture signifies neither high-bandwidth networks nor ubiquitous digital services but rather the continuous circulation and transformation of media, especially through nonlegal networks. Piracy is a fluid and often irrelevant distinction in this larger scene of copying, borrowing, remixing, and remaking cultural goods—of "copy culture," in Sundaram's terms. Sundaram and Larkin explore these dynamics in detail, from the social practices that shape this economy, to the way local industries play both sides of the moral dichot-

omy of ownership, to the role pirate infrastructures play in enabling "licit" market development.

Mizuko Ito's contribution (Chapter 6) opens Part II, "Public Lives of Users," which focuses on ethnographic accounts of emergent sociotechnical practices. Her chapter relocates the theme of recombinant media practices and global cultural flows to the context of global media products like the children's cartoon/card game *Yu-Gi-Oh!* (and its analogs, *Pokémon* and *Digimon*). *Yu-Gi-Oh!* is a *media mix,* that is, a product shaped by carefully orchestrated deployment across many media types: comics, card games, cartoons, video games, movies, and so on. Ito's chapter focuses on the practices of *Yu-Gi-Oh!* players and collectors—primarily Japanese children—as their own systems of circulation and valuation diverge from those of *Yu-Gi-Oh!*'s corporate owners. For Ito, the ability of *Yu-Gi-Oh!* collectors to scale these practices into sizable subcultures and alternative commodity economies is the sign of a new condition of *hypersociality,* produced at the intersection of childhood, commodity capitalism, and communication technologies.

T. L. Taylor (Chapter 7) extends this reflection on the changing conditions of "play" by examining the two-way interaction between game players and game designers in computer gaming cultures. Increasingly, the game play is just one instance of a larger set of participatory practices that run from massive player participation in the production and testing of games, to "modding" and other forms of player production of game content, to ongoing forms of player community commentary, documentation, and derivative media. We are still in the early stages of this new integrated commodity form, in which play has been reconverted into labor but also vested with new creative power. The question of who owns or controls this player production, and to what extent, is a fundamental one for Taylor and for this volume.

danah boyd (Chapter 8) explores another story of play and (lost) control—in this case in the context of the online social networking tool Friendster. Friendster was developed initially as a dating service but rapidly evolved into a platform for a wide variety of identity practices and performances among early-adopter groups. Unlike the "magic circle" of games, which traditionally posit a separate world as a condition of play, Friendster and other social networking tools try to map real-world social relationships in ways that extend users' capacities to visualize and manage social networks. In practice, boyd argues, tools like Friendster achieve this only by radically flattening the textures of social worlds and by reducing the capacities of participants to set,

recognize, and navigate social boundaries. Efforts by users to reintroduce these forms of texture, and by the designers to control the range of user behaviors, provoked a conflict that undermined the positive, self-reinforcing Friendster dynamic as rapidly as it had emerged.

Friendster's sudden popularity is an example of "contagious media," to use the term that Jonah Peretti (Chapter 9) introduces here—media spread primarily through interpersonal networks, via email, file sharing, and other distributed communication channels. Contagious media successfully exploit the "power law" characteristics of networks—their capacity for exponential growth. In a typical social network, one person has connections to many others, and each of those persons is connected to many more. Information can spread very rapidly through such a system. The fact that this process depends on the behavior of the nodes themselves (in social networks, on voluntary communication between individuals) is one of the reasons why networks have gained currency as a way of talking about publics. The history and utility of this analogy is the subject of Warren Sack's contribution (Chapter 10).

Shay David (Chapter 11) takes up a different set of problems associated with social software and large-scale, open-ended online communities: specifically, the challenge of legitimating knowledge produced within such communities, both for the community members themselves and in relation to external, often more traditional, sources of authority. Although questions about the reliability of Wikipedia have drawn the most recent attention to these issues within self-organizing knowledge communities, Wikipedia is only one of a number of new digitally mediated models of knowledge production, authority, and community. David's chapter works toward a typology of these models as well as a broader account of the transformation of knowledge production as educational institutions, especially, lose their monopoly on processes of credentialization and the production of expertise.

Robert F. Nideffer's contribution (Chapter 12) opens Part III, "Corporate Architectures." These chapters resituate earlier accounts of creative practice within a discussion of technical systems and culture industry agendas. Nideffer's piece explores the spatialization of digital technologies from a new direction—not libraries and history, as in Crane's account, but rather games as a leading application of "ubiquitous computing." Nideffer's research terrain is marked by the diffusion of networked devices into the material environment, which is rapidly eroding the clearly demarcated experiential boundary between online and offline. The history of networked gaming

is central to this story because it is recurrently a history of exploration of new forms of sociability, with debts to a hacker ethic that privileges creative control over digital tools and the digital environment. For Nideffer open networks—networks that privilege interoperability between systems over proprietary barriers and corporate "walled gardens"—are both an ethical condition of this creative control and, increasingly, a practical requirement of ubiquitous computing. Doug Thomas (Chapter 13) picks up one of Nideffer's main cases, the game *Diablo,* to examine a different form of transfer between the material and the virtual—the emergence of mass movements (in this case, anti-Korean xenophobia) within the game world itself.

The concluding chapters by Joe Karaganis (Chapters 14 and 16) and Tarleton Gillespie (Chapter 15) extend the argument that the growth of a user-centered concept of cultural agency has depended on both deliberate and serendipitous conditions of open networking and imperfect control. Karaganis first discusses the dependence of the major culture industries on tightly controlled commodity chains, and the threat to these commodity chains posed by open networks and general-purpose computing. He focuses on the corporate consensus about the need to reinvent basic principles of networked computing in order to secure culture as an industrial commodity. Gillespie examines the almost limitless potential for price discrimination as this more controlled environment enables detailed customer surveillance and preference tracking. In Chapter 16, Karaganis looks specifically at the technologies of this emerging cultural order, from filtering, to digital rights management, to the more ambitious effort to lock down the networked environment known as "trusted computing."

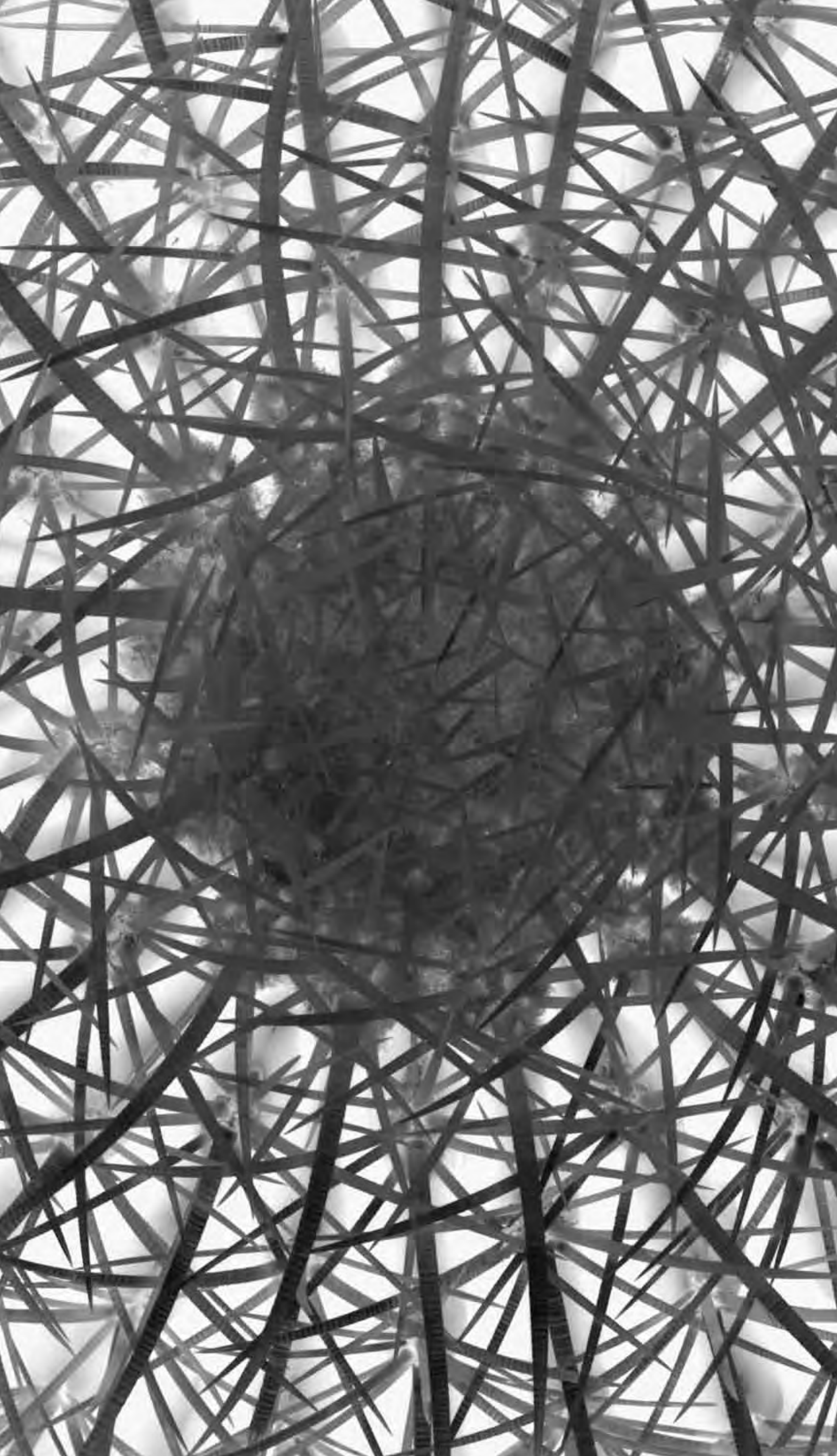
Digital culture, in our account, is not just about new forms of collaboration or about corporate control, although these features are central. It is also about the transformation of what it means to be a person or a cultural actor located within a vast and growing reservoir of media, data, computational power, and communicative possibilities. Of these aspects, communication may be the most familiar dimension and the easiest one to study and understand. In contrast, we have fewer tools and models for understanding the power of databases, network representations, filtering techniques, and other new architectures of agency and control. We have fewer accounts of how these new capacities transform our shared cultures, our understanding of them, and our capacities to act within them. Advancing this account is the goal of this volume.

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notes

1 This position is identified most strongly with the Frankfurt School theorists of mass culture, but visible more generally in the vast literature on "media effects."



ALTERNATIVE GEOGRAPHIES

2 The Past and the Internet

Geoffrey C. Bowker

In the course of human (and nonhuman) history, it is rare enough for a significant new regime of recording the past to develop. There have been two in the past millennium before the present change: the development of the practices of written record keeping (Clanchy, 1993, p. 3) and the invention of the printing press (Eisenstein, 1979).

What we know about the past—and who has access to such knowledge—has changed dramatically with each such change. The changes run far deeper than the mere proliferation of data points. As written records of large estates held in monasteries in France achieved legal and social dominance, the role of women as the tellers of the past fell into decline (Geary, 1994): The technological and the social were deeply intertwined. The outcome was that different kinds of records were kept. With the invention of the printing press, the progenitor of modern computing Charles Babbage (1837) proclaimed that, until the invention of printing, "the mass of mankind were in many respects almost the creatures of instinct" (p. 59). Now, the great were encouraged to write, knowing that "they may accelerate the approaching dawn of that day which shall pour a flood of light over the darkened intellects of their thankless countrymen," seeking "that higher homage, alike independent of space and time, which their memory shall for ever receive from the good and the gifted of all countries and all ages" (p. 54). Since printing, the rate of progress of humanity has "vastly accelerated"; over the past three or four centuries "man, considered as a species, has commenced the development of his intellectual faculties" (ibid.). The language is overblown, but the possibility of conversations across the ages (Landor, 1882) through access to table talk in salons as well as philosophical tracts has indeed changed our relationship with the past.

We are perhaps not quite at the point of witnessing the inaugural act for the archive of computer-mediated communication, but its prophets are many. One relatively sober form comes from Avi Silberschatz, Michael Stonebraker, and Jeff Ullman (1994):

> **There is now effectively one worldwide telephone system and one worldwide computer network. Visionaries in the field of computer networks speak of a single worldwide file system. Likewise, we should now begin to contemplate the existence of a single, worldwide database system from which users can obtain information on any topic covered by data made available by purveyors, and on which business can be transacted in a uniform way. (p. 929)**

Computer scientists have frequently announced the dawning of a new age. Thus, Pierre Auger (1960) declaimed, "Now, after the age of materials and stuff, after the age of energy, we have begun to live the age of form" (p. ii). The old age, he argued, was one of diachrony and materialism: It gave us the historicist visions of Darwin and Marx. This age, he argued, is that of synchrony and form. When such an epistemic break is operated, the knowledge of the previous age becomes irrelevant; when the break is constituted by the move from diachrony to synchrony, the past is doubly deleted. Ravi Sundaram (Chapter 4, this volume) cites Debord's tying this move to synchrony with the dominance of the commodity form; indeed, the commodity as "form" (a class of grain with no past traded on the futures market, say) rather than content (a particular sack of potatoes that holds its history all the way to distant markets) is, in Cronon's (1991) analysis, key to the transformation of mid-19th–century America. There are many analogous inaugural acts for perfect memory systems woven into the fabric of our history.

As social scientists engaged with the new technology of the Internet, we are faced with myriad claims about how the present is different and how the future will be reconfigured. However, we rarely think about how our relationship with the past changes with such new technology. In this opening chapter, I propose that a new regime of technologies for holding and shaping past experience has been developed through a process I call *databasing the world*[1]—and I explore some implications of this new regime for how people understand their lives and their collective histories—how, in other words, they negotiate this profoundly altered structure of participation and representation of their worlds. In particular, I argue that only through understanding our ways of configuring the past with new technologies can we develop new models of participation in the construction of knowledge and power. This challenge is fundamental, and will be explored throughout this volume.

what traces do we leave? (in which it is argued that we leave a lot of traces)

So where are we today? I rarely think about the traces that I leave in the world as an ecology. I tend to think of them (when at all) quite concretely. First, there is my library. It operates as a form of external memory for me (on the rare occasions when I use it) and as a commemoration of things I have read. Its probable fate after my death is its dispersal into a hundred homes. Marginal notes that I have written will lower the selling price rather

than attract attention. Second, there is the Internet. It is interesting to track dead people online. My friends and acquaintances who died before Mosaic (1992), the first browser, are sparsely represented, and when they are it is generally in a classical, canonical academic style (e.g., footnote references, bibliographies), or in a Mormon database. Those who died more recently carry on a rich afterlife. They often still receive email messages; links to their websites rot very slowly; their informal thoughts are often captured on Listserv archives, on comments they have left on a website (signing the visitors' books). Some people even have "eternal flame" websites,[2] where the problem of maintenance is as live as it is for the Olympic torch. Each of these modes of memory was in place before Mosaic, but it is now possible to articulate them in ways that were previously unworkable. It would take a researcher a lifetime to track down my written traces: where I have signed guest books in weird museums and twee hostels, people with whom I have carried on informal correspondence. Those of us enjoying and being irritated by post-Mosaic syndrome (PMS), leave legible traces across a wide range of our activities in electronic form. Everyone their own Boswell (compare the observation by Greg Crane [Chapter 3, this volume], that the stories of the names on the Vietnam memorial could only be followed by a single person in 200 years—a Funesian futility).

When I think, rarely, about the articulation of the set of traces that I am leaving, I have the immediate apprehension that it is not the real me that's out there on the Web. I know the times when I have censored myself (oh problematic concept!) and when I have performed actions to complement—and frequently to confound—a trace. Thus I might write a positive review of a friend's book and then offer close colleagues a different reading.

Taken globally, the set of traces that we leave in the world does without doubt add up to something. It is through operations on sets of traces that I understand an event that I take part in. Tolstoy wrote about the foot soldier in the Napoleonic wars. The soldier he describes cannot have the experience of the war he is waging nor the battle he is fighting because the only "global" traces of the war are inscriptions—notably, maps and statistics. There is no scalable observation that moves from "I was in a copse hiding behind a tree and was terribly confused" to "I took part in Napoleon's bold attack on Uvarov's flank." In this case, where is the "experience" of the war? When we experience a war, we rely on the aggregations of other experience to ground and shape our experience. In general, we use scientific representational forms

to fashion our experience—notably, over the past 150 years, statistical analysis has acted as a proxy for collective memory.

With digital archiving in all its forms, however, a new regime of technologies for holding past experience has emerged. Our past has always been malleable, but now it is malleable with a new viscosity. Whereas in the past our experiences were frequently (literally!) pigeonholed into rigid classification systems, leading to a relative paucity of tales we could tell of our past, today the traces have multiplied and the rigid classifications are withering. (Who now does a "tree" search using Yahoo categories in preference to the random access mode of Google?) New forms of governmentality, based on holding knowledge about the past, are emerging in which the map and the statistic become the prime instruments for governing the territory. It is not that we have the ability to aggregate brute numbers—that has been available since the early 19th century at least in a number of domains (notably the insurance industry; Yates, 1993). Rather, it is that we can aggregate that data along multiple different dimensions, and perform complex operations over that set of dimensions. It is the pleats and the folds of our data rather than their number that constitute their texture. There is a new, rich interiority accompanying the faster global exchange of information and people. I have access to my fleeting thoughts of previous years in my Eudora outboxes, all carefully kept since memory is so cheap today (contrast with the scrapbooks of previous generations). My subconscious and unconscious vie in what could be called my "paraconscious" —the massive sets of traces of my past that I have randomly accessible to me (cf. Derrida, 1995).

A central aporia[3] is constituted by the very general condition that what we leave traces of is not the way we were, but rather a tacit negotiation between ourselves and our imagined auditors (whether in the sense of listeners, readers, or moral or economic watchdogs); and yet we also need at some level an understanding of what actually happened in order to forge our futures. The aporia takes many forms. The recent Microsoft trial is a good example. Microsoft was hurt during the deliberations by the seizing of internal email correspondence that had been pretty explicit about their brutal business practices for assuring CEO Bill Gates his power base. After a series of similar actions, companies started springing up offering products to completely clean disks of all traces of correspondence. Merely erasing the messages is not enough (they might still be there as information blocks that a hacker could access) and shredding hard disks is expensive and a little silly; go to Secure

Delete, “the digital document shredder” (http://www.aladdinsys.com/mac/secure_delete/). Companies are now generally aware of the need to destroy and massage their email, much as they have destroyed and massaged paper records over the centuries. A similar move was made in the 1930s by the Schlumberger company, when they realized that their internal records could be scrutinized by a court. They shifted very quickly from writing detailed accounts of their practices in French to writing highly sanitized versions in English (Bowker, 1994). Similarly, Ed Hutchins (1995) observes that records kept of navigation on Navy ships are written with an eye to a future legal enquiry should there be an accident (p. 20). Scientific texts are written not to record what actually happened in the laboratory, but to tell the story of an ideal past in which all the protocols were duly followed. The past that is presented should be impregnable, thus avoiding perpetual worrying over whether Pasteur misrepresented his findings or Mendel messed with his peas.

It takes a great deal of hard work to erect a past beyond suspicion. When I tell my life story to a boss or a coworker, there are many things I do not mention, discontinuities I skate over (Linde, 1993). It is very rare to commit a story to paper with a view to telling it, in Ranke’s phrase, “wie es eigentlich gewesen ist” (As it actually happened). Stories are told in a context, under a description (Hacking, 1995). The aporia to which we shall return is that despite this central fact about record keeping, there is still a need to keep good records. The Microsoft Corporation needs to retain and propagate a memory of how to be a predator; Schlumberger wants to know how to work around regulations; scientists want to be able to show their students how an experiment really works. This brings us to the central question of memory practices. Acts of committing to the record (such as writing a scientific paper) do not occur in isolation—rather, they are embedded within a range of practices (technical, formal, social) that I define collectively as *memory practices*. Taken as a loosely articulated whole, these practices allow (to some extent) useful and/or interesting descriptions of the past to be carried forward into the future.

the promise of the searchable database

In Eugène Sue’s *Le Juif Errant* (Sue & Gavarni, 1845) two memory regimes are pitted against each other: the Wandering Jew, who tracks his family and its fortune by remaining incessantly awake; and the Jesuit, who tracks the

same family and fortune across the centuries through extremely efficient record-keeping practices. The problem with personal memory and records is that there must be an act of recording: Either Ahasuerus must have a memory trace in his brain or the Jesuit needs to write his secret reports and file them efficiently. One read on the current set of memory practices is that we are moving culturally from the era of recorded memory to one of potential memory. There are so many and multiply determined traces out there on the Internet, and they are so easily searchable, that I (this is the comedy of the commons) do not have to worry so much about collecting my own books and films, annotating them, jotting down obscure facts and quotes on index cards, memorizing genealogies. It's all out there, should I need it at any time—and it's truly random access. For example, if I am caught on a recondite reference in the *New York Times* Sunday crossword I certainly do not need to rack my brains as I might once have done, or search sequentially through several dictionaries and encyclopedias. I simply can type in two or three keywords and someone somewhere will have written about whatever it is and put it on the Web. If I want to remember (as I have) the name of a childhood friend, I don't need to call up my ever-unreliable brother—I can find it on the Web.

Recall the optimism of Aldous Huxley (1963) that, with due attention to spirituality and drug ingestion, one could recover all those lost traces and enjoy the total memory that our brains record. In a sense I now have this available to me because a lot of other people are endlessly writing, recording, putting online. A few points about this activity though: First, my potential memory is so great partly because I am white, bourgeois, male, academic, and American—my set of traces is much more likely to have been covered by these effectively random acts of recording than those of a Cameroonian avocado farmer. In the welter of data, it is often hard to remember how culturally and politically weighted the Internet is. Second, this random-access potential memory is culturally central. Ants seem collectively to be intelligent because they individually leave countless chemical traces in their environment: The environment itself is altered such that a stupid ant can still find food. Similarly, as Halbwachs (1968) argued, we configure our physical environment to act as a constant aide-mémoire, from the Stations of the Cross in a church to the architecture of our offices. Now we have a past which is much more, and multiply, present in our lives, and this changes who we are, what we think, and what we can say. Third is that we can only talk about an "immanent technological space," to borrow Sundaram's (Chapter 4, this volume)

felicitous phrase, for the technologically competent—our environment now is intelligent for those with the technological hardware and competence to listen to it closely.

so what difference does it make? (in which it is argued "a lot")

Historians refer to the period 1920–1980 as the lost years. During those years, a lot of schmoozing, conferring, and deal-cutting was done over the phone, with no trace being left for the sorry chronicler, who was forced into semiotic analysis of recondite documents to guess real motivations for a given action. In the 19th century this was not the case—there was so much use of letters, and postal delivery was so much more regular. Thus if I want to know about Charles Babbage's real reasons for writing his awful Ninth Bridgewater Treatise (a paean to the emerging computer as a metaphor for God's action on earth), I can go to his correspondence with John Herschell and Charles Lyell—frequently several letters a day. In the lost years, the restrained astronomer and geologist would have called Babbage on the phone and pummeled him orally rather than have written.

It is so easy to leave and to assemble traces that we are developing a kind of universal prosthetic memory. That memory creates profound differences in our consciousness and in our work practices. All that had been fleeting or consigned to a folder itself consigned to dust is now, should we wish, active and present in our lives. The past, L. P. Hartley wrote, is a strange land—they do things differently there. What we are witnessing is not a cultural shift from no memory (the lost years) to good memory (after the Internet), but from memory practices marked by written and oral communication to memory practices marked by electronic and oral communication. The distinction is important. When network technologies came on the scene, the ecology of storytelling and record keeping changed fundamentally. M. T. Clanchy (1993) remarks that in Europe it took about 200 years for people to trust written documents over witnesses with memories. There were just too many ways to forge documents in the old days, until the invention of practices like the chirograph (the tearing of a document in half, with the agreement reproduced on both halves). It took a few hundred years for footnotes to develop. It took hundreds of years to move from a recognized need to make documents to a recognized need to store them (the invention of the archive).

We are currently undergoing just such a slow yet dramatic shift in our relationship with the past. Its final results are unclear: The "save everything" mentality of the early days has already been replaced by the "save the minimal legal set" mentality of many companies and individuals today. At the same time we are exploring new genres for keeping people and events live on the Internet long after their respective ends.

The really important shift that I see occurring is in the way of storing and accessing the past and its knowledge. The encyclopedists in the 18th century and the great classifiers of the 19th century regarded knowledge as a relatively stable edifice, built out of relatively standard bricks. The grand overviews of knowledge and hierarchical orderings of knowledge they gave us have generally crumbled. Now we are freed from the technological underpinnings of their beliefs, that is, we are no longer forced to engage in the same sets of orderings of the knowledge and events from the past in order to encompass huge datasets.

Social scientists have generally been loath to study information infrastructures—the record itself has seemed secondary to the story that the record could yield. Yet when new methods of record keeping are emerging that radically alter our relationship with the past, it behooves us to explore the possibilities and limitations of our new infrastructure. Geary (1994) points out that the new writing culture in France spawned a wave of forgeries, which led future historians to see a radical break in European history about the year 1000—a break due to a change in record-keeping practice. Clanchy (1993) notes that the story of the liberating power of the printing press (which he associates quite plausibly with the rise of the totalitarian state) has been told by precisely those humanist scholars who benefited from the invention. Finally, with so much of our social gaze directed at the future possibilities of the new technology (e.g., databasing species to preserve biodiversity; producing a world encyclopedia; realizing the nightmare of a surveillance society), social scientists need to draw attention to and seek ways to understand how our very relationship with the past is quietly being reconfigured, and with revolutionary effect.

why it makes a difference (one context)

The past 200 years have witnessed the growth of global planetary management (Elichirigoity, 1999; Serres, 1990): Our "natural contract" and our "social contract" each demand the same effort of information integration in order to

develop. We now have global readings of insolation (the amount of energy coming in from the sun); the amount of that energy that is converted by living organisms (through the surrogate measure of carbon fixing); and the percentage that is consumed by people. People have become the obligatory passage points bar none in the (political) ecology of the planet. We take a dominant percentage of incoming solar energy; we control more than 95% of free-flowing water resources; we have since our inception been carrying out a process of sustained extinction of other species that is culminating in a catastrophe of global proportions. We take similar control over each other, disciplining ourselves to temporalities and ideologies that allow us to be governable (Foucault, 1991; Luke, 1999).

How do we gain such empire over the present? Over the past 200 years, massive new waves of information classification and standardization have taken place—international classifications were developed for diseases, work, criminal physiognomy, and so forth. Facts could be split apart, sorted into pigeonholes, and reassembled in new ways. It is a direct outgrowth of this work at the turn of the 21st century that we get the emergence of the database as a central cultural form. Lev Manovich (1999) puts it beautifully:

As a cultural form, the database represents the world as a list of items and it refuses to order this list. In contrast, a narrative creates a cause-and-effect trajectory of seemingly unordered items (events). Therefore, database and narrative are natural enemies. Competing for the same territory of human culture, each claims an exclusive right to make meaning out of the world. (p. 225)

Manovich develops the syntagm–paradigm couple, where the syntagm represents a statement that is made and the paradigm represents the set of possible statements. He argues that with the new technology: "Database (the paradigm) is given material existence, while narrative (the syntagm) is de-materialized. Paradigm is privileged, syntagm is downplayed. Paradigm is real, syntagm is virtual" (p. 231). While the observation obtains, its veracity should not be tied to the growth of new information technology (IT). IT in recent times is like medicine in the 19th century—claiming bragging rights for heroic changes which happened by other means: The improvement of life expectancy in medicine then was tied to the unglamorous work of producing safe sanititiation systems; the current status of databases completes the movement begun in the unglamorous 19th century of universalizing classification systems.

One can see Manovich's argument becoming true in the development of database technology the 20th century. The first commercially available computer databases were organized hierarchically. If you wanted to get to a particular piece of information, you went to the overarching category and made a series of choices as this category broke down into groups then subgroups until you got to the specific piece of information that you required. This mode of traveling through a database was called "navigation." The next generation, network databases, followed the same logic, that is, the user had to follow one of a number of predefined pathways in order to get to the data. It was more ordered than a straight narrative archive but it still preimposed a set of narrative structures on the data. The following generation, relational databases, began to break this mold. The underlying database structure is a set of relations or tables, each table having rows and columns. This matrix form allowed a new form of inquiry to be made: Users no longer had to travel the preset pathways, they just had to declare what they wanted to know in a controlled language. Finally, object-oriented databases operate on the principle that you do not need to know either pathways or relationships beforehand. Each data "object" carries its salient history, and pathways and relationships can in principle be reconfigured at will (Khoshafian, 1993). The canonical scientific act for our time (sequencing the genome) resonates with the social and technical turn toward the nonnarrative memory described by Manovich.

To give a name to the current epoch, I call it the epoch of potential memory. To continue Manovich's trope, this is an epoch in which narrative remembering is typically a post hoc reconstruction from an ordered, classified set of facts that have been scattered over multiple physical data collections. The question is not what the state "knows" about a particular individual, but rather what it can know *should the need ever arise*. A good citizen of the modern state is one who can be well counted, along numerous dimensions, on demand. We live in a regime of countability with a particular spirit of quantification. Michel Foucault (1991) pointed out that this is one of the principles of governmentality: A modern state needs to conjure its citizens into such a form that they can be enumerated. The state may then decide what kind of public health measures to take, where to provide schooling, what kind of political representation should be afforded, and so on. Uncountables in the West are our version of the untouchables in India: a caste that can never aspire to social wealth and worth. In order to be fully countable and

thus remembered by the state, a person needs first to fit into well-defined classification systems. At the start of this epoch, the state would typically—where deemed necessary—gain information on its citizens through networks of spies and informers writing narrative reports. Such information gathering continues today but is swamped by the effort to pull people apart along multiple dimensions and reconfigure the information at will.

But that seems to be quite a jump, from the way in which databases work to the operation of the state. The jump is possible because our way of organizing information inside a machine is typically a meditation on and development of the way we organize it in the world. When the first object-oriented language, Simula, was invented, it was perceived as a way of modeling the way things were actually done in the world. The claim today is still that you take a simple English-language description of system requirements and turn the nouns into objects and the verbs into operations and you are up and running. Object-oriented programming, by this claim, is the ultimate transparent language. At the same time, and from the other end, numerous management theorists claim that now that we have object-oriented programming, we can reconfigure the organization so that it matches the natural purity and form of the programming language. We no longer need hierarchical modes of communication; rather, we can organize according to teams with their own sets of interfaces with management, but where management does not need to know how any particular job is carried out by the team. Thus a programming language that operates as part of an organizational infrastructure can have potentially large effects on the nature of the organization through the medium of organization theory. So object orientation is on the one hand a model of the world; on the other hand the world is learning how to model itself according to object orientation. This kind of bootstrapping process is common when one deals with infrastructures. Generally, I would describe it as the programming language and organization theory converging on a particular instantiation of the organization in which object-oriented programming will furnish the natural, transparent language. This convergence is central to information infrastructures. We make an analytical error when we say that there is programming on one side, with its internal history, and organization theory on the other, with its own dynamic. The programming language is very much part of the organizational history and vice versa. James Beniger (1986) made this kind of connection in his work. Following a robust tradition in cybernetics, he noted that in the late 19th century many

things came together to make process control a key factor in management and technology.

Ours is certainly not the first society to hold memory primarily in nonsequential form. Indeed, Claude Lévi-Strauss (1969) demonstrated the nonsequentiality of myth structures (comparing them with the rise of narrative fiction); similarly the memory devices of the Luba (Roberts & Roberts, 1996) and Tibetan *yantras* organize their information space nonsequentially. However, I would argue that it is this turn, begun in the 19th century in offices and in government agencies, that takes us out of the age of the book. JoAnne Yates (1989) traces this transition beautifully in her work on late-19th-century office technology. The earliest correspondence books, she notes, held painstaking transcriptions (or, later, blotted copies) of outgoing letters in chronological sequence. The two great revolutions in office technology, she noted, were the manila folder and the hanging file drawer—these together permitted the rearranging of data into subject files. Later, copying technology (notably the invention of carbon paper) allowed a single piece of information to be stored in multiple places. As this technological work was going on, she notes, there was also a withering of the greetings and salutations in internal correspondence, so that the new genre of the office memorandum was created, which in turn gave rise to the genre of email. At the same time, information that previously had been collected in narrative form (if at all) was now distributed into statistical tables (Chandler, 1977).

We have seen, then, two characteristics of the current memory epoch: greatly increased centrality of the reworking of the past for the operation of the state and greatly increased technical facilities for such reworking with the development of database technology. We are getting to be very good at reconfiguring the past as a tool for exploring and supporting the present. The past that we are colonizing in order to do this work is not "wie es eigentlich gewesen ist." On the contrary, the canonical archival forms of the present tell the past as it should have been. Comte (1830–1845/1975), I think, sets the tone for this whole period with his assertion that we cannot afford to keep in our own minds (and to pour into the minds of children) what actually happened in the history of science. There is now, he said, too much science out there for this to be feasible. Rather, what we should do is classify the sciences completely and tell stories about each science that show the logical steps that brought us to our current state of knowledge, a move that today we would call "rational reconstruction." When the new political tradition is created, it

tells the story of a past that should have been, in order for current political conditions to be justified.

Information integration, then, has a lot to do with the power of the state—the ability to collect data from numerous disparate resources, collocate it through the production of (im)mutable mobiles, and then use it to plan the future. In order to achieve this integration, we weave together stories about the past of the earth, the past of the cosmos, and the past of our knowledge out of a tangle of threads. Our reading of the past is generically under the description of the present set of entities and phenomena. The paradoxical, problematic myth of our progressive society is its insistence on background stasis. Past time is the same as present time; past entities the same order of entity, and the present is effectively perfect. The goal is to stop the extinctions, stop climate change, stop up the hole in the ozone layer. Within this frozen present, ecosystems and people should maximize productivity. The only good ecosystem is a productive ecosystem, giving us goods and services just like the Third World does (and it is indeed remarkable how moves to preserve linguistic, ethnic, and cultural diversity express the need to freeze the present within a model of global productivity). The great trick has been to project present entities and processes back into the past, leaving the present as the natural and timeless outcome of a teleological process.

We have a restricted set of stories that can tell about the past. Patrick Tort (1989) demonstrated so brilliantly for classification systems the propagation of genetic classification through many social and natural spheres in the 19th century: A good bureaucratic trick travels well. Similarly, the effectiveness of universal timelines and isotropic time and space have been demonstrated through a set of well-traveled bureaucratic developments, from the mundane file folder organized by class and date to the development of object-oriented databases (themselves, of course, subject to the remorseless ticking of the internal computer clock). Out of these tools of empire we create a past of a very particular sort, one in which there is really but one line into the Mnemonick Deep. I have argued for a deeper consideration of the role of our memory practices as the site where ideology and knowledge fuse. My preference would be for a harlequin's coat (Turnbull, 2000) of a past, where contradictory temporalities and entities could be explored. We need to hold the past open so that we do not hypostasize and freeze the present, and by extension limit our own future. People, planets, and purgatory (Le Goff, 1984) deserve multiple pasts.

Just because the past is over does not mean that there is a truth about "wie es eigentlich gewesen ist." The work of creating partial objects and conjuring them into a given small set of trajectories is a work in the present of expanding our empire and our knowledge. If we want the future to be other than how it seems to be turning out, we must create a past that is other than it seems to have turned out. Only an open past can unlock the present and free the future. The information tools of empire (i.e., statistics, databases) lend a certain sense of inevitability to all the changes that we witness—we are either enthralled by the spectacle or deadened by the difficulty of imagining change. Seeing our own past as open, so that our own present is not completely determined, is therefore a political act. The line of argument here is akin to the analysis in Furet's work (1978) that rethinking the French Revolution, or what we choose to define as the revolutionary period (1789–1792; or 1794; 1831; 1848; 1871; 1968), makes a material difference to our confidence in acting in the present, and to our sets of strategies. A new story about the past can be a revolutionary irruption in the present, as Michel de Certeau (1984) so beautifully argues.

As we have seen, at a transitional movement into a new regime of memory practices, new configurations of knowledge/power come into play. These new orderings of the past are generally portrayed post hoc as liberatory by those who benefit from the change (as we saw with Geary and Clanchy). Our new orderings are not more accurate (the past is being reworked now just as much as ever) nor more liberatory than previous regimes. However, there are new opportunities presented, and it is a key task for the social scientist to plumb the political roots of the new information infrastructures we are building. The path to a new society is strewn with optical fiber and pocked with silicon chips.

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notes

1 I use the word *database* widely here to refer to the set of traces (records, Listservs, music, etc.) available and searchable on the Internet. The drive to database the world can be tied back historically to the growth of governmentality (Foucault, 1991).

2 See, for example, http://www.venus.co.uk/gordonpask/

3 According to the Oxford English Dictionary, *"aporia* is a figure whereby the Speaker sheweth that he doubteth, either where to begin for the multitude of matters, or what to do or say in some strange or ambiguous thing." See the lovely discussion of aporia in Agamben (1993).

3 History, Memory, Place, and Technology: Plato's *Phaedrus* Online

Gregory Crane

"Databasing the world," as Geoffrey C. Bowker (Chapter 2, this volume) describes it, puts us in new relation to some old problems. As Walter Ong and others have pointed out, Plato's *Phaedrus* treats writing much the same way that many now treat computing, as a kind of alien and alienating technology (Ong, 1982). The Egyptian god Theuth offers writing as a drug for memory. The king Thamus replies that writing, far from strengthening our memories, makes us lazy and undermines our ability to internalize knowledge. While Plato's *Dialogues* sketch a vision of transcendent knowledge and portray human existence as a shadow of higher reality, the *Phaedrus* suggests that written information has value only insofar as human beings absorb that knowledge and make it their own. With typical irony, Plato uses writing to present a scathing critique of writing as a medium of communication.

The arguments of the *Phaedrus* are too complex and important for detailed analysis here. One could argue that the *Phaedrus* is the foundational text for all information science, because it confronts the problems that emerge when human beings are able to represent language in a durable form external to the human brain. Consider, however, the following critique:

Writing, Phaedrus, has this strange quality, and is very like painting; for the creatures of painting stand like living beings, but if one asks them a question, they preserve a solemn silence. And so it is with written words; you might think they spoke as if they had intelligence, but if you question them, wishing to know about their sayings, they always say only one and the same thing. And every word, when once it is written, is bandied about, alike among those who understand and those who have no interest in it, and it knows not to whom to speak or not to speak; when ill-treated or unjustly reviled it always needs its father to help it; for it has no power to protect or help itself. (Plato, *Phaedrus* 275d–e)

The invention of print, however revolutionary it may have been, did not address the criticism that writing is inherently static and cannot anticipate the needs of its future audiences, much less adapt itself to the needs of its current readers.

Traditionally, we have addressed the problem by producing books about books and encoding ever more knowledge in material form, whether the medium is stone, paper, magnetic disk, or other tangible physical medium. As Bowker argues, the electronic world has already changed the way in which many—and arguably most—readers consider orienting themselves when they confront a new topic or problem. A Google search of "Phaedrus writing," for example, as I write (in June 2004) quickly brings up very serviceable course

notes and essays that succinctly summarize major points and allow readers to orient themselves within reasonably accessible conversations about this text. For better or worse, the consequences of this shift are already immense and are still evolving. We may be able to influence future development but, barring a collapse of global society that would probably devastate print culture as well, the change is irreversible. The success of tools such as Google reflects, among other things, the reality behind Plato's critique: Documents do not speak for themselves and we often need to elucidate what we see.

Nevertheless, tools such as Google do not convert documents from static illustrations into living things. Instead, they augment one static document with many other static documents. We have not, in print culture, addressed Plato's critique that writings are inert. We have simply added more and more inert documents, as if we were modeling the image of life with more and more individual color pixels.

We face at least two complementary problems. First, documents often assume that readers have internalized specialized knowledge, such as a particular branch of mathematics, a human language, or even the practicalities of a particular place (e.g., the basic layout of a city). A grammar, lexicon, and original language source text of *War and Peace* do little for the reader who has not studied Russian. We need—and are already beginning to see—documents that can restructure themselves to meet the needs of particular people at a particular time. Second, documents are, however, still not intelligent—our books must talk to each other without ongoing human mediation if they are truly to address Plato's critique: A historical text should, for example, be able to ask an atlas to produce maps customized to illustrate its own contents. At the high end, a foreign language document should be able to converse with electronic lexica, grammars, and so on, to translate *itself* into different languages for different users: If grammars, lexica, and other resources are online, Tolstoy's *War and Peace* should be able to translate itself into any language. While polished machine translation remains elusive, we can already do more with language now than we could in a print world.

Many contemporary readers already encounter public domain documents such as (older translations of) Plato's *Phaedrus* online. A substantial portion of those reading the original Greek now exploit electronic reading environments such as that provided by the Perseus Digital Library (http://www.perseus.tufts.edu). This now rather venerable system contains not only links to manually authored annotations but also automatically generated linguistic and

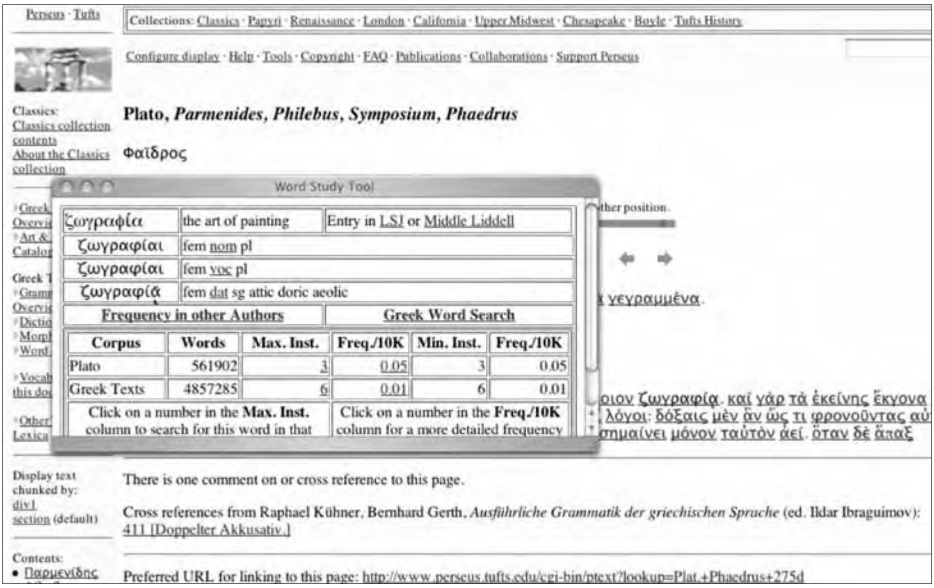


FIGURE 3.1. In a modern reading environment, systems structure information on the fly for a particular text and, ultimately, for particular users with particular interests. In this screen shot, the Perseus Digital Library has generated links from each inflected form of Greek to corresponding morphological analyses and dictionary entries. The reader has called up information about the Greek word for *painting* and can pursue various other links. At the same time, the system has identified other documents that cite this particular passage, thus converting the one-way citations into bidirectional links, pointing back to their source.

statistical data. Rule-based systems apply general procedures to the particular text of the *Phaedrus* and to all classical Greek texts in the Perseus collection. The system thus reads and adds information to more documents than the human author of the system will ever be able to read. Such intelligent systems support increasingly sophisticated and open-ended interactions between reader and text. The Greek reading environment in Perseus answers much more basic questions than those higher levels of interpretation that Plato probably had in mind, but questions of linguistic analysis and lexical meaning are essential to modern readers trying to decode the Platonic dialogue in classical Greek.

The screen in Figure 3.1 illustrates something qualitatively different from a Google search. The system has, in this case, "understood" and converted into usable knowledge the rules of Greek morphology—the system has read and, to some extent, understood a grammar and thus understands what endings can be applied to a given stem. The system has also read and understood the

morphological information in online lexica. From this second source, the system has recognized that there exists a first declension Greek stem *zographi*-. The system then combined grammatical and lexical information when it subsequently read a third document, in this case Plato's *Phaedrus*. Encountering the form *zographiai*, the system recognized several different possible morphological analyses. Such rule-based systems (of which the above is a fairly simple example) produce annotations that may not be written down in any text (e.g., the particular analyses for this particular form) and that are customized for a particular document. Since a single Greek verb can, when combined with various preverbs and dialectical variants, generate millions of possible forms, human annotators cannot enumerate all possible variations of a single form. Even the 91 million words in the *Thesaurus Linguae Graecae* (http://www.tlg.uci.edu/) text corpus, although a static body of material, would defy human annotation. Basic tools such as morphological analyzers, by enabling a three-way conversation between grammar, lexicon, and text, thus begin to address Plato's critique of knowledge as static.

Personalization has emerged as a major new area of research. Basic database technology can enhance the dialogue between the reader and the Greek text above. We can, for example, compare a reader's previous experiences with the task at hand. We can thus help readers track all the words and texts that they have encountered, whether the reader has studied the first 15 chapters of vocabulary from a Greek textbook or has been reading Greek texts for some time. The system can then automatically identify those words that the first-time readers of the *Phaedrus* have never encountered while reminding them how often they have consulted entries on particular terms. Lexical disambiguation techniques described in forums such as SENSEVAL allow us to begin identifying not only new terms but new usages (e.g., *bank* as financial institution vs. border of a river).

A reading environment should help readers identify topics of potential interest to them. For the reader of Greek, identifying key terms and phrases may be important, since that will allow the reader to select a subset of unknown language for close study and active understanding. The significance of particular terms varies, however, based on the current state of the reader. Readers working through Xenophon's *Anabasis* should pay attention to terms that recur in this particular text even if these are not common elsewhere; the reader examining one passage of Xenophon extracted from a broader search should simply view glosses of any terms important to Xenophon but nowhere else.

A mature reading environment should also make inferences about the reader's interests, adjusting the presentation to their past behavior. The system should be able to extract and gloss documents to suit the interests of military historian, political philosopher, and cultural historian. Since the same people may combine multiple interests, the system should intelligently gauge the current focus of a particular reader. Ultimately, every time we confront a new document, our reading environment must labor to help us make the best use of the scarce resources, both cognitive and temporal. The human life span is short: If we read one book a day, every day, for 80 years, we would cover only 30,000 books—3% of a modest research collection.

the library on the street, in the field, and in the mind

The previous section suggested some of the things that we could implement with reasonable effectiveness today with well-documented techniques. Were all the computer scientists at work in the world now to stop their research and the record freeze as it stands in 2004, the implications of their work would nevertheless continue to increase and the shock waves would probably grow in intensity as new historians, their habits not yet formed and their backgrounds immersed in technologically aided thought, took fresh looks at how we conceive and explore history.

Consider one simple category of application. A "touring machine" tracks the location of a person in space and is able to deliver relevant information. In augmented reality, the system tracks the gaze and strives to determine automatically what the viewer sees, adding overlay information on a visor (Hollerer, Feiner, & Pavlik, 1999; Pascoe, 1998). There are difficult technical problems involved in identifying what a person sees: GPS measurements only place us within a few feet of a location, while even a slight lack of precision in analyzing the angle of the vision rapidly projects outward to a large variation, with the error growing greater the farther away the object is perceived. Building an augmented reality system for visitors to an observation tower looking at particular buildings and landmarks would therefore be difficult. The principle is, however, clear enough and, if we are to plan seriously for historical studies, we need to imagine the implications for such systems when they the follow the PDA, cell phone, MP3 player, and other gadgets now ubiquitous in our society.

Augmented tourism is easy to imagine. A family might choose to explore where its roots extended a century before. Pushing several generations back probably carries most American families beyond the confines of North America

and/or into a cultural space in which they no longer master the language. They might find themselves in a particular neighborhood of Warsaw, a farming community in Mexico, a fishing village in China, a town in Syria—almost anywhere on the planet. The system should aggregate information about their family and the world in which they lived, coordinating where possible historic representations with present locations, administrative data such as census records and city directories (if these exist), as well as more general cultural data, including representations of the music and culture current at any given point in the past. The system should provide basic translation and other language services to help visitors interact in the present.

The technical aspects of this scenario should not distract us from a much more profound shift. In the above scenario, the library has burst the bounds of its physical limitations and traveled outward into the field. The digital library system that manages all this information reduces immense bodies of data to a manageable amount—and, conversely, extrapolates from partial data to offer plausible readings for gaps in the record. For the human, however, space has become readable. Wherever we turn our gaze, whatever language finds its way into our ears, whatever fragrance we draw in can become an object of query and reflection. For some, this may threaten mystery, but for many of us, knowledge and knowing are the pathways to wonder and beauty.

The tourist tends to pursue a Herodotean view of history. We spend large sums to visit historic locations, listen to our guides, wonder at the spectacles and curiosities that we have never seen, scarcely prepared ourselves for, and preserve them as memories rather than as starting points for further contemplation. The tourist industry depends for its existence upon instincts to wander and to escape our daily environment. Touring machines as they are commonly conceived thus tend to be associated with superficial, if expensive and momentarily intense, intellectual processes. Enhancing our experience of new and strange environments may shock us into a broader perspective of the world but does not in itself support the difficult, incremental, and lengthy processes of learning.

Consider then, as another example, a 5-mile commute, each day the same except when traffic or bad weather lengthen a dreary routine. How many stories do we pass that, like Plato's statues, remain mute? How many people lived and died along those streets? Who toiled and struggled to coax crops out of the stubborn soil now covered by asphalt? What Native Americans crisscrossed this land as hunter–gatherers? What teams of architects worked long

into the night struggling to win the contracts for each glittering new office building? What dreams surrounded the now-tired facades and what visions of beauty animated their weathered ornamentation? Every space has its own stories and its own special sources of wonder. John Stilgoe's little book *Outside lies magic: regaining history and awareness in everyday places* (1998), as well as his more academic publications (Stilgoe, 1982, 1983, 1994; Stilgoe, Parry, Dunwell, & Robinson, 1993), lets the reader see the world with new eyes.

Our libraries can follow us wherever we wish to bring them. We can explore a new story every day we travel to work. The city of Cambridge in which I live sent 4,000 men to fight in the Civil War. If one were to hear about one of these people per day, one could spend more than 15 years of commutes with a new life story to contemplate each day. The 58,000 names on the Vietnam memorial would occupy more than 200 years.

The point is not how many individuals would actually spend every day for decades cycling through the stories of a single group. Rather, such numbers indicate the depth of information that quickly surrounds any public space. Thirty thousand spectators at a single sporting event spend as much time in that one partially shared day as we live in a lifetime. The depth of information—of ongoing history—around is vast and seen by most of us as often as if it were stored on one of the moons of Jupiter. We who are historians and whose responsibility it is to communicate an understanding of the past must now think about the conversations that our fellows will be able to pursue. We can now think not only beyond the classroom and the book but also beyond the broadcast and the couch and into a world that is alive with answers to the questions that our curiosity selects.

conclusion

If we see in history an analytical process—perhaps a habit of critiquing sources or of understanding change—the applications of information technology are clear enough. Computerized databases are effective because human societies have been progressively organizing themselves to fit the categories of bureaucratic governance for thousands of years (Scott, 1998). Information technology extends a vision that began to take shape when the first accountants pressed sticks into clay. This vision leads to immense benefits—most of us now alive would be dead if we followed the actuarial tables of humanity before the 20th century. Nevertheless, our formal academic work often draws its strength precisely from its reductive and top-down perspective.

Information technology offers immense advantages for the disciplined subjective experience of history. We can not only convert knowledge into information but help others turn that information into knowledge and that knowledge into the wonder and felt beauty that for many of us is the goal of our most ascetic labors.

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4

Other Networks: Media Urbanism and the Culture of the Copy in South Asia[1]

Ravi Sundaram

Contemporary globalization has drawn attention to Indian cities in ways that could not have been foreseen just a decade ago. For many decades the urban's place in the nationalist imagination remained ambivalent—the crucible of both modernization and disorder (Prakash, 2002). But the decade of the 1990s was a series of concentrated shock experiences for Indian cities: temporal compression, spatial transformation, assaults on older industrial areas, and a vast new mediascape that now envelops cities like an all-pervasive skin.

Cities have borne the brunt of the new globalization both in transformative and imaginative terms, with changes in infrastructure and social arrangements, and constant expansion. Yet the new focus on cities in India cannot but reveal a paradox. At the very moment when scholarship seems ready to engage with the Indian city, contemporary globalization has in fact slowly but surely eroded the old modernist compact of "the city." The technological sublime of the planner imaginary, so central to postindependence India, is giving way to a splintered urbanist sprawl in the main metropolitan cities. Planning bodies now base their strategies on smaller projects rather than unitary visions, and push for privatized decoupling of infrastructures; transportation design privileges the automobile overpasses and private toll highways to facilitate rapid travel to the suburbs; private builders take over from older, albeit limited, concerns with social housing. This splintered urbanism is by no means unique to South Asia; it reflects a larger global process of rapid urban transformation in the contemporary period (Graham & Marvin, 2001).

This urbanism in India has become a significant theater of elite engagement with claims of globalization. At the heart of the new urbanism is a certain discourse on the *technological*. The old planner imaginary has now been replaced by a world of fast-moving commodities, transnational networks, and elite service workers, seen typically located in Bangalore and Hyderabad, and Delhi's new suburban sprawl. However, consumption, the "information" society, and the new economy, as well as the spatialized imprints of the media industry like multiplexes and malls, go hand in hand with the cries of urban decay and pollution. They are linked to populations that are increasingly restless in the new arrangements. Splintering urbanism may in fact suggest strain within older techniques of governmentality, which as Partha Chatterjee (2003) has pointed out, was based on the conceptual division between citizens and populations. Whereas citizens were part of a

homogeneous national imaginary, populations were empirical categories of people defined through administered welfare policies. The relations between populations and the state were mediated through the domain of a "political" society whose complex social arrangements and political mobilizations could not be formulated within the classic state–civil society relationship.

Using Delhi's media networks as an example,[2] I want to suggest that new domains of nonlegal networks could pose significant problems for classic strategies of incorporation and management in political society. These nonlegal domains open up new spaces of disorder and constant conflict in Indian cities that threaten the current self-perceptions of the globalizing elite. At the heart of this disorder is a widespread "culture of the copy," which is implicated in sophisticated local and transnational networks, and which strikes at the heart of the idea of intellectual property,[3] the mantra of the current elites. Although this disorder is acute in the Indian context, it is characteristic of the globalizing city more generally, spread by the confluence of cheap digital technologies, strain on urban governmentality and integration, and the emergence of intellectual property as a global discourse of control. In the terms of this volume, copy culture is an intermediate "structure of participation"—a pervasive fracturing—in a broader process of globalization and technological change.

smooth and broken networks

In recent years a growing, sophisticated global literature has engaged with the new urbanism and networks. Two streams pertain to this chapter. The first is the geography of globalization that focuses on networks and flows, aided by rapid communication networks and flows of financial capital, that is transforming urban spaces. Saskia Sassen (2001) argues that a new geography of centrality and marginality has emerged globally with financial centers concentrated in certain core cities with a large, increasingly disfranchised low-end workforce helping provide services and backup. These services—financial, legal, and operational—are subject to a high degree of centralization in global cities (typically located in downtowns), managed by an expatriate elite that runs a global network of service subcontractors and processing firms. Manuel Castells's (1996) network society thesis focuses on how a new space of flows draws producers of information goods everywhere into powerful communication networks. Elite urban enclaves service and house these classes, simultaneously marginalizing other forms of labor in the city. Positioning in the new space of flows becomes part of the strategies

of new info-elites. The second stream of literature emanates from what can only be crudely described as a critical phenomenology of urbanism, ranging from the rediscovery of the work of Georg Simmel and Walter Benjamin to the contemporary engagement with the work of Michel de Certeau and Henri Lefebvre. The latter stream is less explanatory than reflective, working through a series of critical interventions in the urban.

In his remarkable reflection on the contemporary, Zygmunt Bauman (2000) poses the idea of a *liquid* modernity as intimating the new epoch. This was in contrast to the earlier modern, which

> **could be dubbed, for lack of a better name, the era of *hardware,* or *heavy* modernity—the bulk-obsessed modernity "the larger is better" kind of modernity. [This was] the epoch of weighty and ever more cumbersome machines, of the ever longer factory walls wider factory flows and ingesting ever more factory crews.... To conquer space was the supreme goal—to grasp as much of it which one could hold, and to hold to it, marking it all over with tangible tokens of possession and "No Trespassing" boards. (p. 113)**

The constant obsessions of "heavy modernity" were the control of space, instrumental rationality, and routinized time. In contrast, says Bauman, "light" modernity of the software era proclaims (for those with power) the freedom from place and direct engagement:

> **"Fluid" modernity is the epoch of disengagement, elusiveness, facile escape and hopeless chase. In "liquid" modernity, it is the most elusive, those free to move without notice, who rule.... The disembodied labour of the software era no longer ties down capital: it allows capital to be extraterritorial, volatile and fickle.... [Capital's] lightness [has] turned into the paramount source of uncertainty for all the rest. This has become the present-day basis of domination and principal factor of social divisions. (pp. 120–121)**

Fluid modernity operates through high-speed networks, which are not linear as the older forms were, but rather are *discontinuous*. The temporal forms have been well documented by David Harvey (1989): acceleration, and spatial compression, and a perennial speeding-up that produces constant disorientation. Compression is linked to *informationalization* of knowledge; things and ideas die quickly after they are produced. Says Scott Lash (2002):

> **Fast-moving consumer goods are also informational in their quick obsolescence, their global flows, their regulation through intellectual property, their largely immaterial**

nature in which the work of design and branding assumes centrality, while the actual production is outsourced. . . . Power in the manufacturing age was attached to property as the mechanical means of production. In the information age it is attached to intellectual property. It is intellectual property, especially in the form of patent, copyright, and trademark, that put a new order in the out-of-control swirls of bits and bytes of information so that they can be valorised to create profit. (p. 3)

Global network society also produces a range of spatial entities, generic environments: software parks, outsourcing hubs, and data parks. These are akin to Mark Auge's (1995) "nonplaces," which have a uniform brand environment worldwide, buttressed by privatized infrastructural, security, and cultural networks such as multiplexes and carefully controlled shopping areas. Public but noncivil, as Bauman refers to them, these hypermodern spaces are now part of a global urban sprawl from Bangalore's software city to Gurgaon's call center zones in India; the most dramatic regional example is China's Pearl River Delta zone.

I have chosen Bauman's essay as a starting point because it combines a series of provocations, both insightful and speculative, that highlight some of the currents in the contemporary global urban environment. In India they feed directly into the more technocratic refashioning of elite discourses on globalization. The emergence of zones of generic urbanism in India has, of course, occurred in a context of general infrastructural crisis and the widespread perception of urban breakdown. As older systems of urban regulation (e.g., state-supported welfare, transport, health, and education) erode, new practices among middle- and upper-class elites emerge to "engineer certainty": security agencies in middle-class colonies and flats, closed-circuit television (CCTV) and domestic worker identification cards, and demands to register with local police stations. All of this would have been unthinkable but a decade or two ago, but such is true of so many of the urban forms that have emerged with the new globalization.

This urge to order, the curse of the planning city and the dream of the new generic suburban design, is something that has evaded the culture of street media practices in contemporary India. While broadcasting has remained the near monopoly of the media industry, nonlegal distribution and production networks have prised open the music and VCD markets to new publics. This form has emerged in the interstices of contemporary urban growth, disorder, and fragmentation. Equally, street media culture has

spatialized the new urban form in distinct ways. New visibilities, networks-within-networks, and conflicts over intellectual property have changed the old world of the planner city. I want to examine this in the following section by looking at the experience of Delhi.

new networks, media urbanism, and pirate culture in Delhi

"The concept city is decaying," wrote Michel de Certeau (1984). This could also be the story of Delhi's urban landscape for the past 20 years. Urban planning was operationalized around a series of master plans put in motion by the Delhi Development Authority (DDA) since 1957. The DDA sought to organize space through classic modernist urban design principles: enumeration, classification, zoning, and slum management. The fact that Delhi was the national capital gave a certain inflationary charge to the rhetorics of urban control and management, something that has continued even after the decline of the planning model. Since the post-Emergency period, this model has been in secular decline (Baviskar, 2003), due to a combination of factors: mass migration and urban expansion, the breakdown of old systems of classification, and information crucial to planning models of governmentality. The city rapidly expanded through the 1980s and 1990s, both in areas of housing and commerce, an expansion that was mediated through a series of nonlegal informal arrangements for a range of actors: the urban poor, small businesses and local markets, affluent house owners wanting to expand private space beyond legal norms, and, of course, private builders and contractors. This complex system of informal nonlegal[4] urban arrangements was by no means unique to Delhi, but it took on a significant edge, given the emergence of neoliberal and globalizing networks in the region. Small-scale industry, old commodity markets, and historic trading communities have been Delhi's strengths and have largely benefited from the decline of the older control mechanisms. Over the past two decades they have formed new dynamic networks, which have a footprint outside Delhi, often stretching into neighboring states and northern India. This expanding commodity culture used old and new spatial forms—mobile weekly markets and small shops—and also enabled the entry of networks of hawkers and street traders from other social groups. There has been, in other words, a production of *urban density*, a domain that enters new zones of conflict/collaboration in the current period.[5] Recent years have seen a concerted effort to reverse these changes with attacks on

hawkers and small units, as well as the brutal displacement of the urban poor to the periphery; the long-term results of this process may be significant.[6]

My narrative follows the conventional division of Delhi into the following zones: the old walled city area, the center of historic commodity markets and distribution; the New Delhi Municipal Council area, which is the space of the colonial capital and the current political class; and the south, which encompasses the more affluent parts of the city and where networks of corporate globalization are stronger than in the other parts of the city.[7] The northern and western parts of the city took in significant parts of the post-Partition population and are mixed areas of both working-class settlements and middle-class colonies. It is in the east of Delhi, the Trans-Yamuna area, that a significant portion of the city's population lives; the east also houses the various small factories that are crucial to the informal media networks. Two regions—Noida, in Uttar Pradesh, and Gurgaon, in Haryana—have been prime candidates for the new generic urbanism: an integrated combination of growing global call centers, shopping malls and multiplexes, and private toll-road development to service automobile users. This classic secessionary development[8] is the most "global" spatial form yet in contemporary Delhi.

Media discourses have tended to privilege the lifestyle zones of southern Delhi as representing the future of the city's route while lamenting the crisis of governance, the environmental crisis, and general urban ruin. The old stories of social conflict have been increasingly replaced by a significant argument about *property*. It is difficult to find a newspaper today that does not on any given day carry police and industry reports about raids on "pirate" industries. Along with the figure of the Islamic terrorist, the figure of the pirate is threatening to the emerging regimes of property and control in the media. As we shall see, this has become one of the major sites of everyday conflict around property claims today.

As in many Indian cities the new globalization transformed media networks in Delhi.[9] At the level of the everyday, the old prohibition and regulation on the social life of commodities have proved ineffective, and urban residents are now assaulted with a deluge of cultural products, cassettes, CDs, MP3s, VCDs, cable television, gray-market computers, cheap Chinese audio and video players, thousands of cheap print flyers, and signage everywhere. What is remarkable here is that the preponderance of these products comes from the gray or informal sector, outside the effective regulation of the state or large capital. India today has the world's second-largest music market, a

large film industry with global dreams, a mostly gray computer market, and thousands of tiny phone and word-processing shops and cybercafes. And as if from the ruins of urban planning, new media bazaars that supply these networks have emerged, existing in the cusp of legality and nonlegality. Every day a guerrilla war rages between new intellectual property raiders, the police, and unceasing neighborhood demand for grayware.

India never saw a print revolution as early modern Europe did, but the cassette revolution of the 1980s transformed popular music culture. As the historian Peter Manuel (1991) has shown, cassette culture in the first phase of globalization, largely nonlegal, effectively broke the stronghold of the large music companies by introducing new artists and expanding the market for low-cost cassettes, which were sold in neighborhood shops. Long-forgotten "folk" music emerged, remixed and circulated in the market. This was followed by the cable television and computer expansion of the 1990s. Delhi was a significant site of this transformation as it was also the home of the music company T-Series, the first major beneficiary of this phase. Gulshan Kumar, the first proprietor of T-Series, used an opening in the copyright laws to push version recording, an innovative use of lesser-known artists to sing tunes sung by well-known singers. In doing so, T-Series inaugurated a media form that has developed dynamically all the way to the recent remix culture and has also become the "nodal" form for the development of new music companies. The key to this is the mix of the legal and the nonlegal:

- **Using a provision in the fair use clause of the Indian Copyright Act, which allows for version recording, T-Series issued thousands of cover versions of GCI's classic film songs, particularly those that HMV itself found to be unfeasible to release. T-Series also changed the rules of distribution by moving into neighborhoods, shops, grocery shops, paan wallahs, and teashops to literally convert the cassette into a bazaar product.**
- **T-Series was also involved in straightforward copyright infringement in the form of pirate releases of popular hits relying on the loose enforcement of copyright laws.**
- **Illegally obtaining film scores even before the release of the film to ensure that their recordings were the first to hit the market (Liang, 2003).**

The T-Series phenomenon led to the development of new media markets in the 1980s and the 1990s: Palika Bazaar in Central Delhi for video, Nehru Place for software and hardware, and Lajpat Rai Market in the Old City for music as well as hardware for the cable industry. Transnational links

with South and East Asia were established for hardware supplies. Through the 1980s a range of small players in the media markets developed new networks of distribution and production. Production was concentrated increasingly in the Trans-Yamuna areas and parts of Uttar Pradesh and Haryana, while distribution was managed from the media markets linked to neighborhood entrepreneurs. The early years were a period of the media boom when entrepreneurs imported blank media and hardware from East Asia, built satellite dishes and hardware ancillaries, and developed local cable distribution. Music companies emerged catering to a range of tastes all over northern India.

What is remarkable is that except for T-Series, which is now a mainstream player (committed to intellectual property law), the bulk of these new enterprises remained small. This was pirate culture in its early phase, which was innovated through networks but still crucially linked to the main media markets.

In an earlier essay I termed this phenomenon a pirate or recycled modernity (1999), which is dispersed and unconcerned with modernity's classic search for originality, fashioning itself in fluid movements in India's cities and towns. And it is a phenomenon that is neither oppositional nor critical in the classical sense, with no charters against the electronic elites or hypermodern spaces. Pirate modernity is part of a culture of insubordination and disorder that marks our time, and is a source of major concern to global and local elites.[10] There are a number of features that mark this phenomenon that may be pointed out. First, pirate electronic culture is part of an *immanent* technological space. In other words, it presumes that classic distinctions between technology and culture, between humans and nonhumans, have ceased to hold in the contemporary city. The inherent problems of positing a strict human–nonhuman distinction has been pointed out by Bruno Latour (1993), who claims that old-style humanist discourses between subject and object, nature and culture, and so on, are rendered fuzzy in the contemporary. In fact, media experiences in the 1990s in India can be read as the failed collision between technology and tradition: Every aspect of social life in cities has been "thingified"—phones old and new, audio and video systems, electricity legal and illegal, music, and a growing mobile network.[11] "Things" and humans interact and are enmeshed in Indian cities in every possible way, rendering classical distinctions problematic. There cannot be an urban contemporary without the "technological," something

made possible as much by pirate culture as by the media industry. It is precisely the "dirty," discontinuous, and mobile possibilities that make this sphere interesting.

Second, pirate electronic networks are part of a "bleeding" culture,[12] constantly marking and spreading in urban life. Ambient sound and images are now part of all street/neighborhood life; a crowded pirate aesthetic pervades video culture and local advertising. This is part of the culture of dispersal, which marks its resilience and is a nightmare to classify. In a world where information bleeding is part of the contemporary (text messaging, television text scrolling, newspaper inserts, lamppost stickers, Internet pop-ups, event branding), pirate culture uses the ruses of the city, but *immanently*. In doing so it affects the main media industry—in music, version recording/remix is a large and growing market.[13] The pirate video aesthetic, with its informationalized, overcommodified frame, is a compulsory part of any film experience on the local cable network.[14]

Third, pirate culture is a *just-in-time* culture. The copy arrives on your cable network the weekend the film is released, and the music versions of popular numbers follow almost immediately. Networks in Delhi use a combination of regional and transnational sources (Dubai, Pakistan, East Asia) to ensure the culture of the instant.[15]

Finally and crucially, pirate culture is a culture of the copy.[16] It is part of a world where experience as we know it is increasingly commodified and informationalized. For the globalizing middle class in India this is happening through the more familiar modes of incorporation: credit cards and credit rating agencies, frequent flyers, vacations, niche marketing, ATM cards and monthly billing cycles, corporate consumer campaigns, and brand environments, all generating vast amounts of information. This is the more conventional, almost generic world of the new globalization. The networks of pirate culture, on the other hand, usually target the urban populations outside this world, but nevertheless are increasingly drawn to the commodified forms of urban experience. Local markets, neighborhood music/video stores, grayware computer and audio–video assemblers, and independent cable operators are usually part of the pirate network of distribution, which also "bleeds" into other parts of the city. The commodities of the copy are multiuse, recombined/recycled, and in constant circulation, moving in and out of new spaces and networks.[17] In Delhi the media copy exists in a symbiotic relationship with all other commodities and industries: clothes, cosmetics, medicine, household

goods, and also car and machine parts. As is evident, copy culture puts pirate modernity right into a global social conflict on definitions of *property*.

a brief history of the copy

Historians of print and the preprint period have shown us complex forms of the reproduction of texts and cultural objects that existed both in the world of Christendom and the Dar-ul-Islam. In the west, medieval monks and notaries toiled away copying books, legal documents, and contracts. In particular, the medieval notary played a crucial role in the emerging sociolegal relations of the emerging absolutist state. Says one historian,

> **Stenography transforms the spoken word into the written. Copying transforms the One into the Many. Notarizing transforms the private into the public, the transient into the timely, then into the timeless. . . . The notary was a symbol of fixity in a world of flux, yet the making of copies is essentially transformative—if not as the result of generations of inadvertent errors, then as a result of masses of copies whose very copiousness affects the meaning and ambit of action. (Schwartz, 1996, pp. 214–215)**

The historian Elizabeth Eisenstein (1980) suggests that with the coming of the print revolution, a "typographical fixity" was imposed on the word. The sheer volume of the print revolution was incredible; between 1450 and 1500 more books had been printed than those copied in the entire previous history of Islam and Christianity. However, it seems to me that Eisenstein's assertion is too categorical. For the first 100 years, errors were rife in printed books; papal edicts against "faulty Bibles" had no effect on the volume of production. Print, in fact, opened up the floodgates of diversity by the 17th century: Historical work on the cultural uses of print in the French Revolution shows the proliferation of pornographic, anticlerical, and revolutionary texts. There were deliberate forgeries and insertions of parodic statements into official texts. Such forgeries, reinterpretations, and parodies were common to popular print culture, but the issues raised by art forgers after the emergence of modern painting went straight to the heart of authenticity, individuality, uniqueness, and historicity as the representational architecture of the bourgeois artwork. Discussions of forgeries and copies of artworks had existed since the Renaissance, but what is interesting for our purposes is the practice of forgery as a cultural act.

The Hungarian scholar Sandor Radnoti (1999), in his book *The Fake*, has this to say on the practice of art forgery:

The forger attacks originality from the point of view of historical authenticity, insofar as his work gives the impression that it *contains* the story that conveys the same historical evidence as the original. However the clock of history is ticking away for the forger's work as well, it too embarks on a life of its own, and it is only a question of quality, good luck, and time that having survived in historical memory sufficiently long, it becomes authentic, a genuine forgery. (p. 43)

Forgery, says Radnoti, is a functional art form, which "interchanges the interchangeable, substitutes the unsubstitutable." The crisis of authenticity of the cultural object has been present from the outset of modernity; it intensified rapidly after forms of mechanical reproduction were invented. This is, of course, the argument of Walter Benjamin's important and controversial essay, in which he argues that copies and mechanical reproductions of art subvert the authenticity of cultural products. This, says Benjamin, subverts the "here and now" of the artwork, "its unique existence in the actual place it happens to be" (1968, p. 220). For Benjamin, the aura is the marker of bourgeois art, the "spiritualization" of commodity fetishism, something that is destroyed by new techniques of copying. Critics have pounced on the technological innocence of this essay, and the reappearance of aura in the new culture industries, but the value of Benjamin's essay lies in its synoptic power and bold imaginative insight into the culture of the copy in modernity.

The major transformation of the culture of the copy takes place in the 19th century. From the times of the Renaissance, when copying of cultural products was common and legitimate, the 19th century saw the emergence of proprietary regimes of mechanical reproduction, when the culture of the non-legal copy entered a secular period of criminalization and delegitimization.

the commodity

Benjamin's essay had the merit of posing the key issue: A new form of commodification enables the means of mechanical reproduction in contemporary capitalism. Circulation now emerges not as a "lack" to the world of production, but as a sphere that enables a range of practices of consumption, reproduction, and performance. But for most of the 20th century, the radical tradition inveighed against the world of circulation. The generalization of the commodity form is paralleled by the decline of subjectivity and loss, reification, the transformation of the living into the dead. In his important book *Time and Commodity Culture* (1997), John Frow uses Guy Debord's

Society of the Spectacle to open up the discussion on the troubled relationship between the radical avant-garde and the commodity.

Debord's essay makes the point of citing Feuerbach's preface to the *Essence of Christianity*, which posits that the present age is one "which prefers the sign to the thing signified, copy to the original, representation to reality, the appearance to the essence" (p. 1). For Debord, the modern world presents itself as an accumulation of spectacles. "All that was once lived directly," says Debord, "has become mere accumulation of spectacles" (ibid.). Detached from life, images become autonomous, producing a reality that is but psuedoreal. The spectacle is the most general form of the commodity conforming to that historical moment when the commodity form completes its colonization of life. Time and space become abstract and lifeless, the former unity of the world is lost. Debord's essay attained a cult status during its time and was widely read. What is interesting about it is an overwhelming sense of loss. The essay has a structure "which opposes representation as such to the immediacy and unity of life, which sets the latter pole within a lost past." For Debord, the spectacle is "the reigning social organization of a paralysed history, of a paralysed memory, of an abandonment of any kind of history founded in historical time" (cited in Frow, 1997, p. 7). It may be argued that Debord's brilliant but flawed polemic is an easy target. I actually want to use Debord to draw attention to an old tradition in 20th-century radical thought: the generalized denunciation of the commodity form as a phenomenon that negates history and memory. The heritage Debord draws upon is a certain version of Marxism, combined with a heady cocktail of critical theory and 1960s counterculture. Marx himself saw the commodity as having a life before capitalism; capitalism differs in that it promotes generalized commodity production, the extension of the principle of exchange and social relationships around it to all spheres of social life. The history of capitalism, therefore, is the progressive extension of the commodity sphere. Immanuel Wallerstein calls it the endless drive to accumulation; there is accelerative logic to this, the transformation of labor, land, and materials into value, to beget more value.

What about the commodification of cultural products? The philosopher Frow (1997) argues that this takes place at a number of different semiotic levels:

- **In the case of printed texts we could distinguish between an initial commodification of the material object (the book) virtually coeval with the printing press.**

- **A second stage of commodification of the information contained within the material object (and conceptualized in legal doctrine as "the work"), of which the major historical expression is the development in the 18th century of copyright law and the modern system of authorship.**
- **A third, contemporary moment, developed in relation to electronically stored information, which in addition to the copyright information itself, commodifies access to that information. (p. 139)**

Frow argues that these are stages, "in the sense that this sequence while not uniform is normally progressive, and refers to the gradual application of property rights over immaterial entities. It is both the restricting of the commodity form as expanding its controlled use" (ibid).

The contemporary struggle in media networks is therefore not about commodification as such; rather, it is about imposing new *property regimes*. Scott Lash (2002) and Jeremy Rifkin (2000) have argued that as contemporary capitalism emancipates itself from spatial restraints, the struggle is not over the factory but over brands and *domains*. As production of global commodities is contracted out globally, the technologies of reproduction become generalized and accessible, brand protection and network control is increasingly central. It is questionable if we can generalize this for all of contemporary capitalism, but in the case of the media worlds it is even more dramatic. Copy costs are low and distribution mobile.

The extensions of property rights over immaterial objects are key to the informationalization of the world economy, and a significant part of the Trade-Related Aspects of Intellectual Property (TRIPS) agreement of the World Trade Organization (WTO). The emerging global regime of intellectual property legal practice works though pressuring national regimes for changes in local copyright law, a global network of enforcement, and a constant—and, to date, unsuccessful—attempt to generate secure proprietary digital formats for media,[18] a subject taken up by Tarleton Gillespie (Chapter 15, this volume). The key players in this are the US media (film and music) and software industries, but the effort is to build alliances with local media industries. This has been reasonably successful in India with alliances with NASSCOM, the Indian Music Industry Association, and Bollywood antipiracy associations. As Lawrence Liang (2003) argues, summing up the whole scenario,

The information era props up a master plan, similar to that of modernist planning. The institutional imagination of the era relies on the WTO as chief architect and

planner, copyright lawyers as the executive managers of this new plan and the only people who retain their jobs from the old city are the executors of the old plan, the police force and the demolition squad. (p. 13)

The push to crack down on copy culture has led to a number of significant changes to India's Copyright Act of 1957, which have increased the penalties. Minimum provisions now provide for a six-month minimum jail term for commercial piracy along with a minimum fine of 50,000 rupees, with a maximum limit of two lakhs. The period of imprisonment is doubled with a second offense, as is the minimum fine. Illegal "use" of a proprietary computer program carries a minimum jail term of seven days, and a fine of 50,000 rupees. Says the International Intellectual Property Alliance's India report, "With the exception of the level of fines, which should be increased, these are among the toughest criminal provisions in the world. Unfortunately, they have never been implemented" (2003, p. 14). Apart from further changes in the copyright act to make it TRIPS compliant, there have been changes in the Cable Television Regulation Act of 1995 that prohibit cable operators from broadcasting a program without copyright authorization. The act shifts the enforcement to the local district magistrate and police commissioners, who have been designated "authorized officers" and can seize the local cable operator's equipment.

The enforcement regime in India works at a number of levels. The first is the creation of public discourse (e.g., distributing stories detailing the crimes of piracy to a willing press corps). The second is the building of networks with policymakers and MPs conducting seminars and workshops on the dangers of copyright violation. Given the current propensity of our political class for making the media/software industry a central part of the country's global brand, the lobbying has had a remarkable degree of success. Third are workshops for the police and building close networks with the Intellectual Property Cells of the Economic Offences Wing. Fourth are legal strategies, generating prerelease injunctions from courts, Anton Pillar Orders,[19] and collaborative raids with the police against the copy network. The overall effort to enforce intellectual property provisions in India is so wide-ranging that it surpasses older U.S. efforts to push the modernization discourses in the 1950s. The coalition includes elite legal firms specializing in intellectual property law, corporate lobby groups, and local representatives for the U.S. media/software alliances. The Indian media industry is an increasingly crucial player in this equation, with mixed results. In film, for

example, loss-making productions have been released in the pirate market in an effort to recover costs.[20]

Ongoing research into copy culture in the urban morphology of Delhi throws up an interesting picture of emerging conflicts on circulation of media after the passage of TRIPS. It is increasingly clear that the National Capital Region is one of the main centers of copy culture in the country.[21] Delhi is now the center of a complex coordinate of media markets, small software and hardware factories, and local shops that interact with customers. Production sites in Haryana and Rajasthan supply just-in-time media to the copy network, which in turn is linked to factories and routes in Pakistan and Malaysia. Media markets play an important role in distributing to local shops: Nehru Place for computer software and hardware, Palika Bazaar for film media, and Lajpat Rai Market for low-cost hardware and music. Markets typically combine legal and copy nodes, frustrating efforts by the enforcement regime to spatially “fix” copy culture. Nehru Place is thus one of Asia’s biggest computer markets, Lajpat Rai is a distribution center for music companies along with gray audio hardware, and Palika Bazaar sells clothes and crafts along with media.[22] The rise of new technologies like the mobile telephone network, low-cost CD-R duplicating machines, and forms of digital compression like MP3 for music and VCD for film has made the copy network more dynamic, with nodes gaining mobility day by day. In 2003 in Delhi, many neighborhood stores would keep local CD-R machines where they would make collections of MP3s for customers. Copy media (MP3s, VCDs) arrive though nonlegal distributors regularly who liase with media markets and production sites, using the mobile telephone network. The quality of pirate media has recently improved, suggesting larger players in the field. The old grubby covers for copy media have given way to professional-looking designs.

Flexibility and network performance mark some of the emerging local companies in music. Ongoing research into Nupur (Prasad, 2003b), a small music company in Delhi, shows a world where the company (which works out of a tiny office) operates almost like the new multinational enterprises described in Rifkin’s (2000) book, where almost everything—production, studio work, design—operates though a system of *contract*. Studios and factories that produce the company’s music may well also produce a rival’s music; furthermore, Nupur is an enforcer of Intellectual Property (IP) claims in Punjab, where its business is strong and relaxed in other parts.

The IP enforcement regime in Delhi developed a complex, semi-autonomous architecture to engage with copy networks at the local level. The raid holds a central place in this architecture. The raid is a coordinated act by legal firms, investigation agencies, and the local police. As the site where the enforcement regime and the local meet, the raid is informed by performative violence, staged before the neighborhood market. Local copy equipment is either destroyed or seized, software confiscated, and a police report lodged. There were approximately 1,500 raids last year, of which a significant number took place in the National Capital Region. Neighborhood shops, factories, and markets were raided, often leading to significant clashes between the raiding party and local shopkeepers. At the heart of the raid regime is the figure of the investigator, who gathers local intelligence on copying and acts on behalf of a range of clients. These may range from IP legal forms representing large firms, Bollywood film distributors, or music companies. Investigators inhabit a murky world of violence, small rewards, and a cynical contempt for their clients. There is universal belief that enforcement will not work, which is remarkable, given their profession. In some cases the investigators may even come from the part of the world they seek to attack: the pirate modern.

The raid is more of an intimidatory and theatrical act at the local level than a practice that leads to any measure of legal success in the struggle to control copy culture. In actions outside Delhi the raid sometimes collapses into a comical event. Consider this report in the *Indian Express*:

The film industry's attempts to stop video piracy have suffered an embarrassing setback after a raid on a suspected pirate ended with members of the raiding party being arrested by local police and charged with trespass and extortion. It may take more than the intervention of Rajya Sabha MP Shabana Azmi—who took up the issue today—to help it wipe the egg off its face. The story begins with a raid on a house in Jangpura on Sunday morning, where 400 pirated VCDs were recovered. The disclosure pointed to a manufacturing unit in Kundli, Haryana, owned by Mahinder Batla. Owner of a company Lara Music, Batla's two DVD and VCD manufacturing units are worth nearly Rs 10 crores and was set-up three years ago. When a raiding party comprising private investigators of the Motion Pictures Association and the Delhi police reached there, they searched the premises for nearly three hours before the local police arrived on the scene. They accused the team of ''planting the pirated tapes'' and arrested seven people on grounds of trespass and extortion. Six people were released the next morning; one of the investigators, Vikram Singh, is still under arrest. (Jain, 2001)

the copy, the everyday, and the city

As Henri Lefebvre (1987) pointed out, a consciousness of the everyday came into being with industrial capitalism of the 19th century, which ushered in rapid urbanization and rationalization of economic and social life. What modernity ushered in was the *visibility of the mundane*, a new reference point for journalism, modern literature, and ordinary conversation. As the functional elements of life gained prominence and were marked by distinct orders of knowledge and representation, the everyday was the residual that was left over from specialized activity. The canvas was large: eating, sleeping, dreaming, leisure, the cycle of habit and repetition, which coexisted with the linear pull of capitalist time. Throughout the 20th century the everyday has been coded negatively through a series of binaries: common sense versus contemplation, everyday versus aesthetic, ordinary versus heroic life. And the everyday was not "popular culture"; rather, it had a reach that affected all classes. Not surprisingly, the everyday was almost elusive in its banal invisibility. "The everyday escapes," wrote Maurice Blanchot many years later, "it belongs to insignificance" (1959/1987, p. 14).

Georg Simmel's (1971) sociology has shown us how the urban experience produces an *expanded awareness of the present*. It was this experience of urban modernity that gave the present its temporal charge and made it the reference point of creativity from the 19th century. This was what Benjamin called the "actuality of the everyday," when the contemporary becomes *the* marker of urban experience.[23] There are times when this "actuality of the everyday" suddenly takes on meaning: London and Paris in the 19th century, Calcutta for the new urban elites at the turn of the 21st century, Berlin in the 1900s, Bombay from after World War II to the 1970s, Delhi and Bangalore in the 1990s. The actuality of the everyday foregrounds the temporal experience of present-ness.

If we could "date" the time the actuality of the everyday makes itself felt in cities, then in Delhi it was surely the 1990s. The transformations had already been visible from the 1980s onward, when a combination of urban density, expanding market networks, and small production units made Delhi the capital of India's media hardware production and circulation. This was also a decade when the experience of urbanization was nothing less than a series of shock experiences, mediated through the phenomenon called globalization. The introduction to the *Sarai Reader* (Prakash, 2002) captures this period well:

Globalisation, with its mixture of enforced commodification, spatial transformations and urban ruin, excavated the city from margins of academic and literary writing to a new public discourse that suddenly assumed the given-ness of urban space. As elites quarrelled over pollution and decay of public order, new fusions were taking place between the media and the fabric of urban life. "Newness," the old battle cry of modernity (which often had a noumenal existence for most ordinary citizens in post-independence India) was now fused into the sensorium of urban life. The emerging urban constellation in the 1990s was marked by a rapid tempo of sensations transformed by a plethora of signs indicating the arrival of new forms of mechanical and digital reproduction. One cannot overemphasise the experience of shock, compressed temporally, which marked urban space in the past decade. The cultures of distraction, of exhilaration and mobility, of loss and displacement were by no means new—they had been narrated by 1920s European modernism. What was different was as if in this new modern we were deprived of the ability to think, our "social body" emptied out, prised open, "bodies without organs" as Delueze and Guattari have argued, no time to reflect as in the old modernisms. It was as if we were forced kicking and screaming into a new space of flows with the rhetoric of smoothness and non-linearity. However the "place of spaces" was not, as some have argued, superseded by the space of flows. Along with the "smoothness" and the placelessness of the shopping mall, the airport and multiplex, new localities were produced both as sites for work and imagination. The urban became the site for new disruptions and ruses by those rendered placeless in the Smooth City. New struggles and solidarities emerged, once again lacking the mythic quality of the old movements, but adapting, innovating and gaining knowledge through the practice of urban life. (pp. vi–vii)

Despite the language of dualism that colors this paragraph, it captures the atmosphere of the 1990s, when commodities that were explicitly artificial became preponderant in daily life. This experience of the contemporary for millions of people, of a life where "nature" referred to memories before migration or another life, is close to what Benjamin called the "actuality of the everyday," a life in which most of the urban residents know no other products and objects other than those that are industrial, and a perception of the present that seems never-ending, often mediated through the visual representations of events. Memories of the real[24] "past" blur with memories of and identification with media events and experiences: television shows, cricket matches, film releases. This conceptual confusion—between real and virtual memory, between "newness" and an eternal present, between objects

and humans—shows a kind of temporal compression, where features commonly associated with "modernism" and "postmodernism" seemed to blur in one decade of flux. Talking about the second half of the 19th century in Europe, Jean-Louis Comolli said that life was in the grips of what he called the *frenzy of the visible*. This obtained from the constant flow of images and print forms and the transformation of everyday life. The new globalization in India's cities in the 1990s recalls this "frenzy" except in more intensive, cross-media forms. At the heart of this extension of the visible has been the production of media commodities outside the legal property regimes of globalization. Copy culture and nonlegal distribution networks have been central to the spread of the media in a way that distinctions between the technological and cultural seem blurred in daily life. A significant section of the urban population derives their media from these networks. Using the tactics of the fragmentary city, the pirate networks have frustrated every effort of the proprietary enforcement regime to control them. And this is evidence of no South Asian local genius: The pirate modern works through and depends on regional–transnational networks.

In his essay on Naples, Benjamin points to the performative openness of the city: "Porosity is the inexhaustible law of the life of this city, reappearing everywhere . . . building and action inter-penetrate in the courtyards, arcades and stairways . . . to become a theatre of new, unforeseen constellations. The stamp of the definitive is avoided" (cited in Amin & Thrift, 2002, p. 10).

How do contemporary elites in South Asia's cities deal with the problem of porosity and produce the "stamp of the definitive"? Older governmental techniques like technologies of visibility and knowledges about populations clearly continue and expand in Indian cities. Along with national elite obsessions like ID cards and computerized crime records, secessionary enclaves and housing societies are setting up CCTV systems, electronic security, and control of "outsiders." Software companies lobby for national ID cards, which have already been implemented in the border states. Given the absence of any privacy law in India, electronic conversation, both aural and textual, is open for state interception.

But in the porosity of the contemporary city the realms of copy culture thrive. This is the sphere almost akin to what Lefebvre calls the "residual," what is "left over." I say almost, because Lefebvre would have been deeply uncomfortable with the graphic commodity spheres of the pirate

economy, as would an entire generation of radical urbanists who saw critical/redemptive strategies located in the spheres *outside* the commodity.[25] This was the old dream of the transcendence of the everyday though the everyday. The everyday becomes a space/theater for strategies of defamiliarization, redemption, and *detournement*. But as Blanchot points out, "the everyday escapes. This is its definition" (1987, p. 5).

Earlier patterns of political society in India allowed nonlegal populations and networks to assume visibility and enter networks of welfare and administration. Copy culture and the people who thrive in its networks cannot do so easily; it would violate the fundamental concepts of property in the current global/national regime. However pirate culture has no strategies of political mediation—it works though immersion and dispersal rather than representation and voice. It is resistant to both controls as well as radical–critical strategies[26] of intervention, inhabiting networks of disorder that are endemic to contemporary urbanism. This may be its greatest strength and resilience.

Media urbanism may suggest a productive sphere of disorder in the context of a bleak political landscape of arrogant triumphalist elites, neoliberal transformations of cities that end in moving the working poor to the outskirts. Pirate culture moves between common sense and innovation, between the specialized and the mundane. Pirate media culture is a kind of *contagion of the ordinary*, which always disturbs the very "ordinariness" as we have known or theorized. It is precisely because of its nonredemptive nature, a refusal to harbor the possibility of its own transformation into the Festival, that media urbanism is also disturbing to the older radical avant-garde imagination of the everyday. However, as a phenomenon whose elusiveness frustrates property regimes and the current arrangements of power, pirate culture may introduce a new vocabulary to the debate on networks and everyday life.

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notes

1 Parts of this paper were presented at the Subaltern Studies Conference, Delhi, January 2004, and at the Fly Utopia Conference, Berlin, February 2004.

2 Delhi and its adjoining regions are the perfect places to set up this inquiry, as the Indian capital has been the center of a large and rapidly expanding network of production and distribution of electronic goods for the past 25 years.

3 The intellectual property discourse began with the emergence of the circulation of print and has become widespread in the contemporary epoch. Originally centered around the romantic figure of the "author" whose work intellectual property law claimed to protect, the last 300 years have seen the gradual extension of such "rights" over many commodities through copyright, patent, and trademark law. At the heart of the intellectual property discourse is the control of commodities in circulation by corporate entities holding proprietary authorship/rights. This control is rendered further fragile with new technologies of production and reproduction, as well as critical ideas of the public domain, which have emerged from the open source software movement. As networks become more dynamic and extensive, so do the stakes to control actors and commodities. For a useful discussion, see Frow (1997) and Vaidhyanathan (2001). For the important 17th-century English origins of copyright history and its relationship to literary property, see Rose (1993)

4 Lawrence Liang (2003) calls this new urban development since the 1980s a porous legality, which enabled the development of a new media space. Alhough not specifically about Delhi, Liang's essay draws excellent connections between the growth of nonlegal urbanism and the new mediascape.

5 The assaults on "polluting" industries as well as street hawkers are significant examples of efforts to make the city "ready" for globalization.

6 The discourse of scientific environmentalism is used to justify these transformations, often with court sanction (see Sharan, 2002).

7 The South has been in the forefront of the new lifestyle culture, which fills the newspaper supplements: theme restaurants, fashion boutiques, and farmhouse parties. South Delhi also has the large working class settlement of Daskhinpuri, which is largely invisible in the current discourse.

8 The model fits Gurgaon more than Noida, which includes older industrial areas.

9 This section benefits from ongoing fieldwork on Delhi's media networks that is part of the Publics and Practices in the History of the Present project at Sarai, Center for the Study of Developing Societies.

10 Local conflicts in the cable industry are sharp since they involve territorial control. In Delhi large networks have gradually dominated the smaller players who control approximately 40% distribution in the city. For a fascinating story of a large distributor's defeat of a local cable operator with working-class origins, see Sharma (2002).

11 The TRAI posits that India will have roughly 70 million mobile phone users in a few years. Urban infrastructure was always implicated in what Latour (1993) calls a "skein of networks," where networks, places, and people are enmeshed and constantly producing and performing.

For Latour, there are no subjects and objects as in classic Enlightenment thought, but, instead, actants. A criticism could be made of Latour that he generalizes network architecture to the extent of ignoring the worlds outside it. However, his insights remain significant.

12 My colleague Jeebesh Bagchi calls this a "seepage" culture, using the metaphor of architecture. See also Larkin (2004) for an analysis of the pirate aesthetic in Nigeria.

13 The research by Bhagwati Prasad (2003a) showed that there are at least 37 versions of the explicit tune Kaante Laaga, ranging from dance to devotional forms.

14 See Larkin (2004) for a fascinating inquiry into the Nigerian experience of pirate video.

15 "Just-in-time" culture is used by Scott Lash (2002) to describe the information society, in which info-bits arrive, as Virilio says, "at the speed of light." They depart as easily.

16 Copy culture, in Delhi at least, has pervaded all forms of consumer commodities. The National Capital Region is one of the main centers of copy goods manufacture (see IIPA, 2003).

17 See Appadurai (1986) for an early pioneering attempt to understand the journeys and biographies of the commodity.

18 Every attempt to devise secure formats has been broken by the hacker communities.

19 An Anton Pillar Order allows an applicant (*without notice* to a respondent) to enter the respondent's premises and inspect or seize documents or other items. This was used most dramatically in the Ten Sports case, where the court issued an order preventing alternative telecasts (from South East Asian satellites) of the World Cup soccer matches by cable operators unwilling to accede to Ten Sports's demand for proprietary broadcast fees.

20 Most of our interviews with local authorities confirmed this. This practice is by no means unique to India; it has also been noticed in the Hong Kong film industry (Wang, 2003).

21 See the IIPA (2003) detailing the raids and legal proceedings.

22 For Palika Bazaar see Kumar (2002).

23 See the excellent discussion in Harootunian (2000, pp. 5–7).

24 Some of those "authentic" experiences have long been transformed by media techniques. Religious events are staged publicly, using electronic music and video in a few cases, as are weddings and parties. The levels of ambient sound that were always present in the South Asian city have increased tremendously with low-cost amplifying technology and a willingness to deploy it in public spaces.

25 Benjamin is an exception. He uses the idea of profane illumination through older, dead commodities/ruins of capitalism, recalled through allegorical strategies, which could profoundly disturb the contemporary.

26 Alternative strategies may act as a critical witness to the pirate modern, while pushing for nonproprietary worlds, and reflecting on the idea of a commons and a new public.

5 Pirate Infrastructures

Brian Larkin

In 2003 there was a blackout in New York City that temporarily turned life upside down. People who were working stopped; those from the suburbs stayed in the city; strangers talked to each other. Relieved that it wasn't terrorism and proud there was little rioting (unlike the infamous blackout of 1977), New Yorkers instead celebrated a moment of communitas. When society came to a shuddering halt people took this total transformation of everyday life as a moment to bond, a reminder of the coming together that followed the tragic events of September 11, 2001. It was, in this sense, an event marked by its singularity and difference from everyday life. After the electricity returned, everyday life was expected to continue as before, albeit haunted by a sense of the vulnerability of Western infrastructural networks to terrorism. The intensity of these feelings being directly related to total disruption brought about by the blackout itself.

In Nigeria and many nations like it, when electricity disappears things similarly come to a standstill for a few minutes. There is mild surprise, irritation but no shock. Then people walk around to the back of their houses and turn on small generators; businesses fire up larger ones; people light candles in their homes; roadside vendors fill their lamps with oil; and in a few minutes everything goes on as before with people trading, dancing, praying, and eating: the warp and woof of everyday life.

Whereas in New York blackouts bring a sense of vulnerability and reveal the dependence of Western societies on a constant flow of power, in Nigeria no building is constructed without the knowledge that state infrastructures fail. In older buildings, garages are given over to make room for generators. In newer ones, small buildings are made especially to house the generators, which, like the water towers that dot the New York skyline, have become a ubiquitous part of Nigerian life. There, the necessity of electrical autonomy is a basic factor in the architectonics of built space, the structures of planning, and the form and experience of Nigerian urbanism.

Wolfgang Schivelbusch (1995) argues that one of the most important transformations of networked urban life came with the rise of the gas lamp. The introduction of gas ended the autonomy of oil lamps and candles whereby each household effectively supplied its own energy needs. Gas represented the industrialization of light, transforming households into nodes of a centralized power source, linking the domestic and intimate to larger structures of capital and the state. In this way, Schivelbusch argues, it was fundamentally modern. The rise of the electric grid deepened this process, representing the intrusion of capital and then government into everyday life, tying citizens into a new

sort of collectivity. In Nigeria this effort toward centralizing power is associated first with colonial regimes and, later, vastly extended according to the modernizing ambitions of the nationalist, independent state. As the urbanists Stephen Graham and Simon Marvin (2001) have written, the provision of networked infrastructures such as the electricity grid were seen as mechanisms that controlled the relation between the individual and the state, instigating waves of societal progress: "Across the urban world, fragmented islands of infrastructure were joined up, integrated and consolidated toward standardized, regulated networks" (p. 40), networks that became the embodiment of what it meant to be modern.

In Nigeria the grand modernist project of infrastructure was embodied in the robust presence of a state whose involvement in everyday life was to be invisibly mediated through the turning of a switch or the flushing of a toilet. Now, these infrastructures and the states they represent are in conditions of breakdown and degradation. Infrastructures that once promised a new, progressive world for Nigerians have embarked on a slow slide to simulacra, becoming empty repetitions, independent of their technical function. Factories were funded as prestige projects, their representational power more important than whether they worked or not. Road networks and telecommunication systems were funded not just so they could work (although it was nice if they did), but so they could be a mechanism for the awarding of further contracts and the disbursement of monies through which oil wealth could be transformed into patron–client networks (Mbembe & Roitman, 1995). In other words, political allegiances were bought through the awarding of contracts.

The consequence is that nowadays the generator dominates Nigerian life, ubiquitously chugging all over urban neighborhoods, providing the sounds and smells of the city. In areas where central electricity supply disappears for hours and sometimes days on end, the generator bears witness to the collapse of the integrated infrastructural idea and the withdrawal of the state's ambition to provide developmental progress. In the disaggregation from networked electricity to autonomous generators lies the shift in Nigerian society from the developmental state to new forms of individual competitive liberalism. In this sense, the generator is an archetypical technology of contemporary Nigeria. Even the petrol it relies upon is often purchased on the black market, sold by *yan daba* (hooligans, criminals) from individual jerry cans dotted all over the city, their very presence an emblem of the promise and failure of the oil economy.

pirate infrastructure

As stable forms, pirate media do not exist. Out of the river of cultural forms that copy, quote, sample, and borrow from one another, certain media forms are extracted and called into being as pirate media while the rest flow on, never having that term used against them. When we think about pirate media we tend to think of a stable set of objects, but we could more usefully switch our attention from the objects (media) to the performative moments in which this act of naming takes place. What gets termed *piracy* can differ markedly across cultures and is best seen as emerging from specific domains: dynamic localities with particular legal, aesthetic, and social assemblages. This forces us to explain why some objects are called pirate while others are not. Much of the critical work on intellectual property (IP), driven by economic and aesthetic interests dominant in the United States and Europe, examines IP in the legal terms of ownership versus theft and fair use versus the extension of IP regimes (Boyle, 2003a, 2003b; Lessig, 2001, 2004; Sell, 2003). Yet piracy is a technical infrastructure, and like all such infrastructures it influences and shapes the forms of sociability, aesthetic production, and economic organization that mark urban life. While it is understandable that questions of law should dominate the debate about piracy, we also need to place piracy into a history of infrastructures such as the electricity grids and generators mentioned above. Examining piracy as a technical mode rather than a legal one helps pull into focus the form of piracy rather than its content. It looks at what piracy *does* and its resulting effect on people's experiences of temporality and subjectivity, on practices of watching and using technology, on the new forms of leisure and sociability, and in the forging of new aesthetic forms (for a longer discussion, see Larkin, 2004a).

In countries like Nigeria, where my research is based, piracy is first and foremost a system of reproduction and transmission of goods. Pirates are often involved in the "legal" dubbing and sale of Islamic religious cassettes, Nigerian music, Pentecostal preaching, and other media genres. They reproduce and sell Indian music and videos—practices that are rarely, if ever, seen locally as piracy, even though that term could easily be used. For both distributors and their consumers there is little difference in the dubbing and sale of legal and nonlegal goods; both are produced on the same machines using the same blank cassettes and sold at the same shops.

The processes piracy sets in motion occur everywhere but it is, perhaps, in non-Western cities where many of them are thrown into particular relief for two main reasons. First, the presence of what Ravi Sundaram (Chapter 4, this

volume) calls "pirate modernity" is far more advanced in these societies than it is in the West and, in this case, the global south is often at the vanguard of media practices rather than at the rear. For the vast majority of Nigerians, Indians, or Egyptians, for instance, the array of global media is only available through the mechanism of piracy; piracy is thus the default infrastructure through which nearly all foreign media flow. Second, because these are poor societies, and because they are non-Western and so consume media forms that have little to do with the West (such as Arab music in Tanzania or Indian music in Senegal), the manifold practices of copying that occur daily are far less likely to ever be called piracy. This selectivity highlights piracy as an enunciative act, most often called into being when economic resources are at stake. When they are not, or when cultural forms circulate outside the legal regimes most familiar to the West, whole realms of cultural production and social action take place without a clear distinction between what is pirated and what is not.

New infrastructural forms create and recreate conditions for everyday urban life. Like all new technologies, they organize sensory perception, provide new relationships between people and things, and give rise to different forms of affectivity, sociability, and leisure. As an infrastructural mode, piracy in Nigeria has developed its own economic organization, technical modes of transmission, and networks of traders and customers. By expanding the range of media available and the speed with which they circulate, piracy has also expanded the possibility for cultural imagining, the modes of affect that accompany those imaginings, and new aesthetic forms that emerge out of them. In this sense, piracy is not just destructive but generative. In the rest of this contribution, I wish to look not *through* pirate infrastructures to the legal questions that lie underneath but rather *at* them. I take a few short examples of what piracy does in the context of Nigeria as it feeds out and shapes urban experience.

pirate archive

In Nigeria as elsewhere, piracy creates new kinds of archives inconceivable outside of this mode of media reproduction. In markets specializing in wholesale tape duplication, sellers have sprung up specializing in the storage and preservation of different music forms. These sellers maintain substantial archives of Indian film songs, traditional Hausa singers such as Mamman Shata and Musa 'Dan Kwairo, and new music forms such as bandiri, a religious music that takes tunes from Hindi films and changes the words to sing praises to the Prophet Mohammed. Customers go there to commission bespoke cassettes—

compilations of hard-to-get Hindi film songs, or unavailable songs of older Hausa singers. Like most pirate archives, from Internet databases like BitTorrent to religious music sellers to diasporic ethnic video shops, these archives make available specialist media content that lacks the mass appeal that renders other media forms cost effective. Piracy facilitates this archiving practice.

video films

Since the mid-1990s, Nigeria has seen the precipitous rise of a new media form: Nigerian videos. Made in English, Yoruba, and Hausa languages, with large differences in genre between the three language types, these are full-length "films" shot, distributed, and sold on video. Something like 600 films are released each year, and the most popular films sell in excess of 200,000 copies. What is significant about them for this chapter is that, in the north at least, the reproduction and distribution of these films relies wholly on an infrastructure created for pirate media (Larkin, 2004a). Piracy, in this sense, not only generated the capital for investing in equipment (dubbing machines, blank cassettes) but also provided the complex organizational structure on which Nigerian videos could parasitically depend. One of the fulcrums of the industry is the influence of five large distributors, all of whom rose to success through the sale of pirate media. Thus, as Nigerian videos have come to dominate video sales in Nigeria, what has followed is the migration of dealers from illegal to legal forms of media—at least while the profits are mainly found there.

Piracy brought about the structural precondition that allowed for the emergence of this singular media phenomenon: a dramatic "film" industry that makes use of the technical and economic capabilities of video technology. In the north of Nigeria, where more than 230 video films are released each year and where the genre has been dominated by the mimicking of Indian film romances, this success has fomented a small army of people working as editors, camera operators, directors, set designers, actors, composers, musicians, singers, and graphic designers, as well as those involved in distribution and sales. At least three video magazines, modeled on the Indian film magazine *Stardust,* are in circulation and, as with Indian films, there is a substantial local audio market based on the sale of popular songs from Hausa films.

video parlors

In the early years of the 20th century, cinema arose as a profoundly new space of entertainment and social interaction tied to the rise of corporate society.

Siegfried Kracauer (1963/1995) has argued that the arrangement of the cinema hall—the coming together of individuals as a mass arranged in separable, interchangeable rows—meant that cinema-going itself transformed the individual into a commodity. In its way, cinema was the quintessential mode of leisure expressing the political economy of its time, bringing together strangers into a temporary collective only for them to disperse afterward and fade back into the anonymity of city life.

Video parlors are coterminous with the rise of video piracy and represent the spatial embodiment of new economic networks in the way that the cinema embodied the logic of industrial capital. These are small neighborhood operations often based in a room in people's homes or local shops where patrons are charged a small admission fee. There is no sense of awe or the sublime—no Dolby sound system, no arabesque ornamentation, no art deco cathedrals or Chinese theater picture palaces. These are not the nonplaces of popcorn-scented multiplexes. Highly local, video parlors are tied to neighborhoods where people know each other. It is a form of exhibition blurring the line between public and private, distant and intimate, and, in Nigeria, male and female. This clouding between domestic and public is perhaps best seen in the contrast between the moral ambience separating video parlor from cinema in northern Nigeria. Women can visit video parlors without invoking societal fears about unrestricted female circulation in public spaces. This is not necessarily because video parlors are accepted, but more because they are situated within the confines of densely populated Muslim areas in people's homes, so they often are not perceived as public spaces at all.

In Nigeria, video parlors broke the control of exhibition by large-scale cinema chains that had long been dominated by Lebanese distributors screening Indian, American, and Hong Kong films. In these chains, exhibitors were tied to showing the films they could afford, which often meant picking up damaged prints of films that came to Nigeria years after their original release date. In the case of most of mainstream Hollywood, these films never came to Nigerian cinemas at all. The tight link between video parlors and piracy meant that piracy integrated neighborhoods quickly and firmly with the international circuits of distribution from which they siphoned films. Compared with cinema, the range of media they offered was far greater, and they provoked a sea change in exhibition practices as, one after another, most cinema exhibitors in northern Nigeria turned to video projection.

Because of their locality and ties to particular neighborhoods, video parlors were one of the first public modes of exhibition for Nigerian video films. Video parlors had a more intimate sense of audience—both exhibitor and audience member were from the same community—and had a greater tie to newly emerging cultural forms. Running a video parlor could sometimes be a short step up from watching a video at home, where viewing was rarely restricted to a nuclear family but took in many disparate members of a household. It is unsurprising that a film form based expressly on domestic video consumption should find its first public here.

piracy and copy culture

Nigerian video films emerge from the forms of duplication and circulation that proliferate and "bleed" into urban life through the use of piracy. Yet they take part in a larger copy culture in more mundane and literal ways. Hausa-language video films, for instance, have become the dominant media form for tens of millions of Hausa in northern Nigeria, Cameroon, and Ghana by drawing on the long-standing popularity of Indian films in Nigeria. As many of their critics accuse (and many of their supporters celebrate), one of the dominant genres of these films involves the explicit copying of Indian film. The setting and style are translated into northern Nigeria and the language is shifted from Hindi to Hausa, but the stories are faithfully adhered to (see Adamu, 2005a, 2005b; Larkin, 2000). Video film is not the first form to do this. Hausa singers have been copying Indian film tunes for years (Adamu, 2005a; Larkin, 2000) and the 1990s saw the rise to popularity of bandiri music, the genre that copies Hindi film tunes but changes the words to sing religious praises (Larkin, 2004b). Bandiri represents most clearly a key aspect of Hausa films in that the music does not hide its copying and pretend to originality but instead relies on listeners recognizing the Hindi original that underlies the copy.

Like bandiri, Hausa video films are both famous and controversial, intensely loved and vilified because of the overt nature of this borrowing. One of the most successful production houses of northern Nigeria, FKD Home Videos, along with its major star, Ali Nuhu, have specialized in copying from Indian films in several ways that are typical of larger trends in the industry. Many films work within an idiom of melodrama established by Indian films, using romance, love, and family drama to explore larger societal issues. Others are known for copying directly, transposing whole films and changing Indian character names to Hausa ones. This intertextual and piratical influence has increased over time

as the number of films has grown and industrial and aesthetic practices have become standardized. Few early Hausa videos, for instance, had song-and-dance sequences and political dramas alternated with love stories and comedies. As can be imagined, for a Muslim Hausa audience the use of mixed-sex song-and-dance sequences is the clearest example of copying from Indian films, as it introduces a wholly foreign aesthetic element into Hausa cultural production. According to Abdalla Uba Adamu (2005b), the release of two films in 2000, *Wasila* and *Sangaya* (both of which starred Ali Nuhu), which went on to be two of the most successful Hausa video films, shifted the nature of the industry dramatically. Both films relied heavily on song-and-dance sequences and after their release market success became tied to the inclusion of such sequences. Like India, northern Nigeria now has a thriving music industry wholly dependent on songs derived from video films.

In an article in the Hausa films magazine, *FIM*, the celebrated screenwriter Abubakar "Baballe" Hayatu associated with FKD Home Videos explained the process of copying involved in making Hausa films from Indian ones:

I am not the only one who watches the Hindi films [during screenplay adaptation]. We used to watch the films with Ali Nuhu and note the things we should change so a typical Hausa person can relate to it as his culture, rather than shunning it. Thus we adapt what we can to suit our culture and religion. If any scene is neutral to these two issues we leave it as it is. (2002, p. 47)

Tejaswini Ganti (2000), examining the copying of Hollywood films into Hindi cinema, makes the simple but powerful point that all acts of copying are acts of translation. At the minimum, Indian films have song-and-dance sequences added to them, subordinate kinship characters added in, and overt emotional situations injected in order for them to make sense within the idiom of Indian melodrama. The same is true in Hausa films, where Indian films have to be translated into a Muslim social and legal context: Kano state, the area where most Hausa films are made, adopted Shari'a law in 2001. Hausa films borrow most heavily from classic Indian themes of forced marriage (*auren dole*) and the tensions between parental authority and individual choice. But the other great melodramatic theme of polygamous Hausa society is the decision of a husband to take a second wife and the tensions between co-wives that result—a theme absent from Indian cinema.

Piracy has facilitated the particular sort of copy culture that lies behind Hausa video films, especially the sort of direct copying of which the screen-

writer Baballe Hayatu was speaking. Before the dual arrival of cassettes and piracy, when films were shown once a week on television or periodically at the cinema, there could be a general influence but not the close textual control needed for precise copying: pausing, rewinding, examining costumes and camera techniques, and transcribing plot sequences. Many cinema-goers, of course, went to see the same films numerous times, but in Nigeria films are not released for a certain period of time. There a film is screened for one day only; then the print is taken to another cinema in the exhibitor's chain and it may be several months before it returns (again to be shown for one day only). Piracy allows the breaking down of a narrative into component parts and close attention to detail that constitutes this copy culture and on which the development of aesthetic forms such as Hausa video or bandiri music depends.

conclusion

Piracy in Nigeria is part of a larger infrastructure of reproduction where the legal and nonlegal meet. Often in the ways media travel in the world, pirate and legal media are so thoroughly intertwined that it is hard to separate one from the other. They exist in social domains where legal questions are not always present. The Hausa copying of Indian songs in bandiri music, for instance, could be construed as a form of piracy, just as the Hindi films' copying of other music could be. Yet in practice, because this labeling is not called into being, the object itself is never conceived of as pirated. This highlights how piracy is not a stable form but is dynamic, highly variable, and a selective assertion. It also means that analytic attention is dominated by the media forms that generate the most money and are thus subject to the most intense accusations of piracy. Although important, this can often elide what it is that pirate infrastructures do.

Rather than elide pirate infrastructure by seeing it as a window into legal questions of intellectual property, I wish to bring it to the foreground. My interest is simply to explore some of the ways in which pirate infrastructures generate social action and aesthetic forms and to examine aspects of what they do in societies rather than whether they are legal or not. In many parts of the world, media piracy is not a pathology of the circulation of media forms but, rather, its prerequisite. It is the means by which media—usually foreign—are made available and it provides the technological constraints governing how other nonpirate media are reproduced, disseminated, and consumed. Pirate infrastructures create their own modes of sociability and affect their own spatial networks that link places like Nigeria into larger cultural and economic networks.

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6

Technologies of the Childhood Imagination: *Yu-Gi-Oh!*, Media Mixes, and Everyday Cultural Production

Mizuko Ito

Many of the essays in this volume attest to the powerful alchemy of personal cultural production and communication combined with large-scale networks of digital distribution and archiving. While the implications of peer-to-peer exchange for the media industries have attracted considerable public attention, there has been much less consideration of how these exchanges operate in the everyday practices of individuals. In a world of networked and viral cultural exchange—of cultural life captured in distributed archives, indexed by search engines, and aggregated into microcontent feeds for personal information portals—areas of practice once considered inconsequential dumping grounds of cultural production become irrepressibly consequential, even productive. The despised category of "mass consumption," fractured by several generations of poststructuralists and corroded by ongoing research in fan and reception studies, may find a still greater foe in the undisciplined practices of teenage music sharing, game hacking, and personal journal blogs. These emergent digital culture forms signal the active participation of previously marginal and invisible groups in what we must now recognize as *cultural production,* not simply as derivative acts of *active consumption* or ephemeral *personal communication*. What does it mean when those previously constructed as "consumers"—nongenerative, passive audiences for professionally produced culture—are handed the means not only to distribute media through alternative peer-to-peer networks, but to remix, repackage, revalue, and produce media through amateur cultural production?

Shifting structures of participation in the production/consumption matrix are a theme common to many of the chapters in this volume (Sundaram, Chapter 4; Taylor, Chapter 7; David, Chapter 11; and Nideffer, Chapter 12). I approach this question through ethnographic research on children's new media—media targeted at a demographic group most often characterized as uniquely passive, uncritical, vulnerable, and receptive. One focus of my work was *Yu-Gi-Oh!,* the craze among elementary-school-age boys[1] in Japan in the years from 2000 to 2002. *Yu-Gi-Oh!* is an example of a "media mix" of the type pioneered by *Pokémon,* integrating different media forms through licensed character content. The *Yu-Gi-Oh!* animation was released in the United States in 2001, and the card game soon overtook *Pokémon* in popularity. *Pokémon* broke new media ground in its repackaging of strategies and narrative forms of video games as content for serialized, noninteractive forms of media (TV, manga). It innovated further in relying on portable and intimate technologies (Game Boy, playing cards) that enabled kids to perform

these narratives in diverse settings of social interaction (Allison, 2006; J. Tobin, 2004a). *Yu-Gi-Oh!* similarly relies on virtual game play as the focal object of serialized narratives enacted in digital, analog, and everyday sites of play. This chapter analyzes forms of participation in *Yu-Gi-Oh!*-related culture through three key concepts: the media mix, hypersociality, and extroverted childhood. My description seeks to highlight the unique characteristics of Japanese children's culture, while also locating this case within a broad set of shifts linked to a transnational digital culture.

network creativity in everyday practice

My central argument is that everyday life, pursued by—in Jean Lave's (1988) terms—"just plain folks," needs to be theorized as a site of generative cultural creativity and production. This is a *structure of participation* in cultural life that, since the modern era of mechanical cultural production (Benjamin, 1955/1968), has been overshadowed but never eliminated by centralized, professionalized, and capitalized forms of media production. In many ways, this approach draws on established anthropological concerns with everyday practice, folk arts and crafts, apprenticeship, and community. It differs, however, in that it takes up forms of social life that are very unlike the small-scale, geographically localized communities and villages that characterize the classical fieldwork encounter. My objects of study are social groups mediated and focused by new media and networked cultural forms, many of which are mass-produced by media industries. My effort is to rediscover local knowledge and practice within the belly of the massively mediated beast.

Although this chapter is not grounded in as finely textured an observational approach, I take my cue from a wide range of practice-based studies that have described the inherent creativity of everyday practice, ranging from Lave's (1988) studies of everyday mathematics as shoppers navigate supermarket aisles, to Edwin Hutchins's (1995) studies of cognitive tasks involved in ship navigation, to Raymond McDermott's (1988) description of how children generate their own meanings within oppressive classroom settings. Energized by Michel de Certeau's (1984) suggestion that engagement with texts and places demonstrates a similar generative practice, I draw most immediately from studies of fan communities (Jenkins, 1992; Penley, 1991; Tulloch & Jenkins, 1995) and ethnographic reception studies (Mankekar, 1999; Morley, 1992; Radway, 1991) that describe how mass media forms are inte-

grated and reshaped in local ecologies of meaning. The current digital ecology, however, constructs far-flung networks of exchange at the "consumer" or, more appropriately, the "user" level (Benkler, 2000) that radically extend the boundaries of these more long-standing processes of media engagement and reinterpretation. My effort here is to expand this perspective on everyday practice and media reception into digital culture and technology studies. How does everyday practice and local media (re)interpretation and (re)mixing articulate with the translocal, impersonal, and automated systems of exchange mediated by the Internet?

The current digital culture ecology introduces two key sociotechnical innovations central to my framing of the *Yu-Gi-Oh!* case. The first (guided primarily by media industries and by Japanese culture industries in particular) involves the construction of increasingly pervasive mass-media ecologies that integrate in-home media such as television and game consoles, location-based media such as cinema and special events, and portable media such as trading cards and handheld games. Following the industry label, I call this the "media mix." The second (primarily user-driven) is characterized by peer-to-peer ecologies of cultural production and exchange (of information, objects, and money) pursued among geographically local peer groups, among dispersed populations mediated by the Internet, and through national peer-to-peer trade shows. This is what I call "hypersociality." These twinned innovations describe an emergent set of *technologies of the imagination,* where certain offerings of culture industries articulate with (and provide fodder for) an exploding network of digitally augmented cultural production and exchange, fed by interactive and networked cultural forms.

Together, these dynamics describe a set of *imaginaries*—shared cultural representations and understandings—that are both pervasive and integrated into quotidian life and pedestrian social identity, and no longer strictly bracketed as media spectacles, special events, and distant celebrity. I treat the imagination as a "collective social fact," built on the spread of certain media technologies at particular historical junctures (Appadurai, 1996a, p. 5). Benedict Anderson (1991) argues that the printing press and standardized vernaculars were instrumental to the "imagined community" of the nation-state. With the circulation of mass electronic media, Arjun Appadurai suggests that people have an even broader range of access to different shared imaginaries and narratives, whether in the form of popular music, television dramas, or cinema. Media images are now pervasive in our everyday lives, and form

much of the material through which we imagine our world, relate to others, and engage in collective action, often in ways that depart from the relations and identities produced more locally. In children's toys, Gary Cross (1997) has traced a shift in the past century from toys that mimicked real-world adult activities such as cooking, childcare, and construction, to the current dominance of toys that are based in fantasy environments such as outer space, magical lands, and cities visited by the supernatural. Appadurai posits that people are engaging with these imaginings in more agentive, mobilized, and selective ways as part of the creation of "communities of sentiment" (1996a, pp. 6–8). My focus is on the more recent technologies of networked digital media and how they are inflected toward more ubiquitous, activist, and customized engagements with a technologized imaginary.

From 1998 to 2002 I conducted fieldwork in the greater Tokyo area among children, parents, and media industrialists, at the height of *Yu-Gi-Oh!*'s popularity in Japan. My description is drawn from interviews with these various parties implicated in *Yu-Gi-Oh!*, my own engagements with the various media forms, and participant observation at sites of player activity, including weekly tournaments at card shops, trade shows, homes, and an after-school center for elementary-school-age children. I organize my narrative along the twin threads of media mixing and hypersociality, concluding with a discussion of the implications of these technologies of the imagination on the construction of childhood.

the media mix

In the past decade, study of digital culture has increasingly recognized that the "virtual world" of the Internet is a site of "real" politics, identities, and capital rather than a dematerialized realm of free-flowing information (see, e.g., Castronova, 2001; Hine, 2000; Lessig, 1999; Lovink, 2003; Miller & Slater, 2000; Rheingold, 2002). The media mix insists that we also recognize the reverse flow: The real is being colonized by the virtual as technologies of the digital imagination become more pervasive in the everyday environment. *Yu-Gi-Oh!* and its associated ecology of digital technology in urban Japan are indicative of this porous membrane between the real and virtual, the imagination and everyday life. The *Yu-Gi-Oh!* media mix encourages this porosity through products that manifest its creatures and fantasy encounters in everyday life with increasing fidelity and portability via virtual or augmented reality technologies.[2]

Trading cards, Game Boys, and character merchandise create what Anne Allison (2004) has called "pocket fantasies," "digitized icons . . . that children carry with them wherever they go," and "that straddle the border between phantasm and everyday life" (p. 42). The imagination of *Yu-Gi-Oh!* pervades the everyday settings of childhood as it is channeled through these portable and intimate media forms. These forms of play are one part of a broader set of shifts toward intimate and portable technologies that enable lightweight imaginative sharing between people going about their everyday business. In many ways, this ecology is an illustration of concepts of ubiquitous or pervasive computing (Dourish, 2001; McCullough, 2004; Weiser, 1991; Weiser & Brown, 1996) extended to popular culture. In Japan this pervasive media ecology includes trading cards, portable game devices, "character goods" such as mobile phone straps and clothing, screens and signage in the urban environment, and multimedia mobile phones that capture and exchange visual as well as textual information (Ito, 2003; Okabe & Ito, 2003). Imaginative fantasy is now more than ever part of the semiotics of everyday social life.

In the *Yu-Gi-Oh!* comic book (manga), monsters are an intimate presence in the lives of the characters. Characters carry cards that "contain" the monsters, and they engage in duels that combine a card game with lifelike monster battles, projected in holographic 3-D from "duel disks" worn on the players' arms. Boundaries are blurred as the duelists suffer collateral harm from monsters blasting the playing field with dragon fire and destructive magic. *Yu-Gi-Oh!* is thus a very explicit drama of the *hyperreal*—of objects of the imagination becoming more vivid, life-like, and omnipresent, to the point of sapping the strength of flesh-and-blood bodies. But the strange mingling of the real and virtual in the pages of *Yu-Gi-Oh!* is just one aspect of a larger drama of simulation. The *Yu-Gi-Oh!* manga series has spawned a television animation, an immensely popular card game, at least 10 video game versions, and character goods ranging from T-shirts to packaged curry to pencil boxes. All project *Yu-Gi-Oh!* into different sites of consumption, play, spectatorship, and social action.

Yu-Gi-Oh! is similar to the media mixes of *Pokémon* and *Digimon* in that it involves human players who mobilize otherworldly monsters in battle. There is a difference, though, in how this fantasy is deployed. In earlier media mixes, such as *Pokémon,* the trading cards are a surrogate for "actual" monsters in the fantasy world: *Pokémon* trainers collect monsters, not cards.

In *Yu-Gi-Oh!*, Yugi and his friends collect and traffic in trading cards, just like the kids in "our world." The activities of children in our world thus closely mimic the activities and materialities of children in Yugi's world. They collect and trade the same cards and engage in play with the same strategies, rules, and material objects. Scenes in the anime depict Yugi frequenting card shops and buying card packs, enjoying the thrill of getting a rare card, dramatizing everyday moments of media consumption in addition to the highly stylized and fantastic dramas of the duels themselves. In Japan during the period when I was conducting fieldwork, *Yu-Gi-Oh!* cards were a pervasive fact of life, a fantasy world made manifest in the pockets and backpacks of millions of boys across the country. A 2000 survey of 300 students in a Kyoto elementary school indicated that, by the third grade, every student owned some *Yu-Gi-Oh!* cards (Asahi Shimbun, 2001).

As corporate marketing expertise with media mixes has grown—even in the very short trajectory from *Pokémon* to *Yu-Gi-Oh!*—the media mix has come to signify and rely on more than just product diversification across sites of consumption. Instead, media mixes are increasingly designed to sustain intertextual referencing across the different media incarnations. Among other things, this permits the hierarchies of value elaborated in one domain (e.g., between different cards described in the manga story) to underwrite economies of scarcity in another (e.g., the card game, the video games). A biography of one card in the *Yu-Gi-Oh!* pantheon provides an example: The Blue Eyes White Dragon card (or Blue Eyes, for short) is probably the most famous of the *Yu-Gi-Oh!* trading cards. Blue Eyes made its first appearance in 1996, in the ninth installment of the *Yu-Gi-Oh!* comic series in the weekly *Jump Magazine*. "This is the Blue Eyes White Dragon Card," explains Yugi's grandfather. "It is so powerful that production was stopped right away. It is the ultimate rare card that any card addict would give a right arm for" (Takahashi, 1997, p. 33). The card plays a central role in the origin story of the feud between Yugi and Kaiba, the two protagonists, and ultimately becomes closely identified with the latter. Both Yugi and Kaiba are card masters: Kaiba in the mode of ruthless individualism, battling for his own pride and power; Yugi in that of selfless kindness, battling to help his friends and family as well as perfect his game.

A few years after Blue Eyes appeared in the manga, the cartoon series was launched on TV Tokyo. Soon after, the Blue Eyes card was released by game maker Konami in several versions as part of its *Yu-Gi-Oh!* Official Card

Game, thereby entering into circulation among the kids of our world. The first version was released in March 1999, packaged as a starter box complete with cards, playing accessories, and instructions. Konami put Blue Eyes at the top of the card hierarchy, both in terms of rarity and the number of "attack points" it represented. The cards were printed with a shiny surface and labeled "ultra rare," in contrast to normal cards, plain old rare cards, and super-rare cards. As the card game grew in popularity, Konami released new cards in smaller five-card packs, costing just over the equivalent of $1. Konami thereby engineered scarcity within the flow of physical cards (and consequently within the regime of economic exchange). Unlike the starter box, with its fixed set of cards, the smaller packs imply a gamble: As with baseball cards, one does not know exactly what one is getting. There is a chance of receiving rare, super-rare, and ultra-rare cards in addition to the normal cards.

Variations on this theme followed, including the EX pack, divided into a Yugi and a Kaiba deck (Kaiba leading with his signature Blue Eyes and Yugi with his own Dark Magician), and special-edition Blue Eyes cards, such as the undocumented "ultimate rare" card in the "Spell of Mask" series and another version distributed at the *Jump Magazine* trade show in 1999. Product spinoffs and launches have continued to be accompanied by special-edition releases, from the launch of *Jump Magazine* in Japan and the United States to new versions of *Yu-Gi-Oh!* Playstation and Game Boy software. Stickers, notebooks, T-shirts, and pencils, many featuring Blue Eyes, round out the product lineup.

This cross-marketing drives sales and connects the different levels of *Yu-Gi-Oh!* play. Game Boy software ties together the fantasy world of the comic characters and real-life game play, allowing the player to play against the comic characters in story mode, or against other kids by connecting devices together. The linkage between the physical cards and the virtual game cards extends beyond the card inserts in the game packages. Each physical card carries a printed code that can be inputted into the online version, translating the physical card into the online space. In fact, it is nearly impossible to play the Game Boy game without having a collection of physical cards available for virtualization.

Despite the endless forms of production, reproduction, and engineered scarcity through which the Blue Eyes card circulates, the actual utility of this card in game play is limited. Among professional players—and by this I mean both children and adults who compete in national and international

tournaments—use of this card is impractical as well as passé. For players playing by the expert rules, the card is too powerful and unwieldy, requiring two other monsters to be sacrificed in order to be able to play it. The spectacular duels enacted in the comics and cartoons feature flashy, powerful monsters that find their way more into card collections than card play. In other words, the regimes of value (Appadurai, 1986) between the symbolic, monetary, and competitive value of cards are interconnected, but also distinct. For example, gamers value cards primarily for playability, but might also include a card like Blue Eyes in their deck because they identify with Kaiba. Similarly, dealers primarily price based on rarity, but a card like Blue Eyes, which has a prominent role in the narrative forms, fetches a higher price than other cards of similar scarcity.

While the intertextual dynamics of media mixing have existed for as long as people have transcribed oral narratives or dramatized written ones, contemporary versions have unique qualities. They go beyond the more familiar form of adaptation between one media form and another, as when a movie is based on the characters of a book or video game. With *Yu-Gi-Oh!* and similar media properties, multiple media forms *concurrently* produce an evolving but shared virtual referent of fantasy game play and collection. Unlike earlier forms of cardplay, *Pokémon* and *Yu-Gi-Oh!* cards are tied to an immense narrative apparatus of anime and manga series spanning years, as well as digital game play. The media mix forms a heterogeneous but integrated web of reference, manifest through multiple technologies of the imagination. At the corporate level, and as the formats multiply, this requires an integrated set of alliances across a wide range of industries, retailers, and advertisers. At the user level, this means that *Yu-Gi-Oh!* players, readers, and viewers can experience the imaginary as a sustained and omnipresent engagement. Unlike the spectacular film release or the cyclical television special, this form of engagement is often nurtured over years of ongoing viewing, reading, collecting, and social exchange, a relationship more of connoisseurship than consumption.

hypersociality

Yu-Gi-Oh! demonstrates how pervasive media technologies in everyday settings integrate the imagination into a wider range of sites of social activity. Far from the shut-in behavior that gave rise to the most familiar forms of antimedia rhetoric, this media mix of children's popular culture is wired, extroverted, and hypersocial, reflecting forms of sociality augmented by dense sets

of technologies, signifiers, and systems of exchange. David Buckingham and Julian Sefton-Green (2004) have argued in the case of *Pokémon* that "activity—or agency—is an indispensable part of the process rather than something that is exercised post hoc" (p. 19). The image of solitary kids staring at television screens and twiddling their thumbs has given way to the figure of the activist kid beaming monsters between Game Boys, trading cards in the park, text messaging friends on the bus ride home, reading breaking *Yu-Gi-Oh!* information emailed to a mobile phone, and selling amateur comics on the Internet. This digitally augmented sociality is an unremarkable fact of life for the current generation of kids in urban Japan. With the majority of Japanese accessing the Internet through mobile phones and with the rise of the handheld Game Boy as the preferred platform for gaming, computer and TV screens are no longer privileged access points to the virtual and the networked world.

Congregating with their Game Boys and *Yu-Gi-Oh!* playing cards, kids engage in a form of hypersocial exchange that is pervaded by the imagination of virtual gaming worlds. Buzzing with excitement, a group of boys huddles in a corner of their after-school center, trading cards, debating the merits of their decks, and talking about the latest TV episode. A little girl rips open a pack of cards at a McDonald's, describing their appeal to her baffled grandparents. A boy wears a favorite rare card around his neck as he climbs the play equipment at the park, inciting the envy and entrepreneurialism of his peers. As their mother completes her grocery shopping, a brother and sister walk into an elevator dueling with coupled Game Boy Advance machines. When *Yu-Gi-Oh!* players get together, (hyper)social exchange involves *both* the more familiar discursive sharing of stories and information and the material exchange of playing cards and virtual monsters.

Hypersocial exchange is about active, differentiated, and entrepreneurial consumer positions and a high degree of media and technical literacy, rather than the one-way street connoted by the term mass media or mass culture. This builds on the sensibilities of kids who grew up with the interactive and layered formats of video games as a fact of life and who bring this subjectivity to bear on other media forms. The interactivity, hacking, and first-person identification characteristic of video gaming is integrated with cardplay and identification with narrative characters. Players collect their own cards and monsters, combining them into decks that reflect a personal style of play, often derived from the stylistic cues presented by

the manga characters. *Pokémon* decisively inflected kids' game culture toward personalization and recombination, demonstrating that children can master highly esoteric content, customization, connoisseurship, remixing, and a pantheon of hundreds of characters (Buckingham & Sefton-Green, 2004; Yano, 2004)—an environment of practice and learning that Sefton-Green has called a "knowledge industry" (2004, p. 151). These more challenging forms of play have also attracted a wide following among adults.

Like most popular forms of anime content, *Yu-Gi-Oh!* has an avid following of adult fans, often called *otaku,* the Japanese term for media geek (Greenfeld, 1993; Kinsella, 1998; Okada, 1996; S. Tobin, 2004). Adult *otaku* communities are the illegitimate offspring of the *Yu-Gi-Oh!* media empire, and exist in uneasy relationship with the entertainment industries that create *Yu-Gi-Oh!* content. They exploit gaps in both dominant systems of meaning and mainstream commodity capitalism, using tactics that circumvent the official circuits of mass marketing and distribution. With the advent of the Internet, *otaku* communities found their communications medium, an organizing ground for special-interest fan communities and a site for distributing alternative content and grey market goods. Cultural remix is about the appropriation and reshaping of mass cultural content as well as its revaluation through alternative economies and systems of exchange.

One kind of *otaku* knowledge is known as *sa-chi,* or "searching," methods by which card collectors identify rare card packs *before* purchase. I find myself out at 1 a.m. with a group of card collectors, pawing through three boxes of just-released cards. The salesperson is amused but slightly annoyed, and it takes some negotiating to get him to open all three boxes. My companions pride themselves on the well-trained fingertips and disciplined vision that enables them to identify the key card packs. They teach me a few tricks of the trade, but clearly this is a skill born of intensive practice. After identifying all the rare, super-rare, and ultra-rare cards in the store, they head out to clear the other neighborhood shops of rare cards before daybreak, when run-of-the-mill consumers will start purchasing.

Single cards, often purchased in these ways, are sold at card shops and on the Internet. In city centers in Tokyo such as Shibuya, Ikebukuro, and Shinjuku, there are numerous hobby shops that specialize in the buying and selling of single cards, and which are frequented by adult collectors as well as children. These cards can fetch prices ranging from pennies to hundreds of dollars for special-edition cards. Street vendors and booths at carni-

vals will also often have a display of single-sale *Yu-Gi-Oh!* cards that attract children. Internet auction sites and *Yu-Gi-Oh!* websites, however, mediate the majority of these player-to-player exchanges. The total volume is extremely large. One collector I spoke to purchases about 600 packs of cards in each round of searches and could easily make his living buying and selling *Yu-Gi-Oh!* cards.

Children share the same active and entrepreneurial stance, cultural fascinations, and interests as the adult gamers, but they lack the same freedom of movement and access to money and information. The rumor mill among children is active although often ill informed. All the children I spoke to about it had heard of search techniques, and some had half-baked ideas of how it might be done. Children create their own local rules, hierarchies of values, and microeconomies among peer groups, trading, buying, and selling cards in ways that mimic the more professional adult networks. Despite adult crackdowns on trading and selling between children, it is ubiquitous among card game players. Once mobile phones filter down from the teen to the elementary-school-age demographic, these exchanges are likely to be central to an expanded range of communications between kids exchanging information, beaming character art, and cutting deals during their downtime in transit and at home in the evenings.

Another arena of *otaku* cultural production, which I will mention just briefly here, is the publication and selling of amateur comics, often derived from mainstream content such as *Yu-Gi-Oh!*. During my years of fieldwork in Tokyo, I would make an annual pilgrimage to the Comic Market, by some estimates the largest trade show in Japan and the epicenter for manga-*otaku*. The show occupies Tokyo Big Site twice a year, an immense convention hall located on new landfill in the synthetic port entertainment town of Daiba at Tokyo Bay. It attracts hundreds of thousands of manga fans, including large numbers who camp at the site and line up at dawn. The convention center is packed with rows of tables displaying self-published manga, ranging from booklets constructed of stapled photocopies to glossy bound publications costing the equivalent of $20 USD, much more than the average commercial publication. Millions of yen exchange hands as fans queue up for their favorite artists and series.

Unlike the world of the card and video game *otaku,* the manga *otaku* are dominated by working-class girls (Kinsella, 1998, p. 289), with much of the content featuring boy–boy relationships idealized by a feminine eye. For

example, *Yu-Gi-Oh!* fanzines often feature romantic liaisons between Yugi, Kaiba, and Yugi's best friend, Jounouchi (Joey in the English-language version). Unlike professional cultural production, fanzines center on tight-knit communities of peers that both create and buy amateur manga. Artists sit at their booths and chat with artists and readers who browse their work. Comic Market is the largest show of its kind, but a greater volume of zines changes hands through a more distributed exchange network that includes the Internet, regional events, and events focused on specific form of content, such as a particular manga series or genre. There are an estimated 20,000 to 50,000 amateur manga circles in Japan (Kinsella, 1998; Schodt, 1996). Most participants are teenagers and young adults rather than children, but these practices are an extension of childhood practices of drawing manga and exchanging them among friends (Ito, 2006). As in the case of the card *otaku,* manga *otaku* translate childhood imaginaries into alternative adult networks of amateur cultural production and commerce.

Unlike spectacular narratives of good and evil told on the TV screen, the buzz of competitive exchange between kids in the park, the furtive rounds of nighttime collectors, and the flow of cards, monsters, and fanzines through Internet commerce and street-level exchange point to a peer-to-peer imaginary that is heterogeneously materialized and produced through highly distributed social practices. The *Yu-Gi-Oh!* imaginary exceeds the sanctioned networks and contact points of mainstream industrialists and the hegemonic narratives they market to supposedly passive masses of children. While the Internet has taken center stage in our theorizing of new forms of communication and relationality, media mixes in children's content, below the radar of mainstream adult society, have been quietly radicalizing a new generation's relationship to culture and social life.

the cultural politics of wired childhoods

The backchannel discourse of the *otaku* is an example of new forms of commodity capitalism mixing with and sustaining an increasingly entrepreneurial, extroverted, and wired childhood. *Yu-Gi-Oh!* demonstrates how the market for multimedia content is becoming organized into a dual structure, characterized on one side by mainstream, mass distribution channels that market to average consumers, and on the other by an intermediary zone that blurs the distinction between production and consumption fueled by the Internet, *otaku* groups, amateur cultural production, and peer-to-peer econ-

omies. Joseph Tobin (2004b) distinguishes between "*otaku* and snackers" among *Pokémon* afficionados, tracing the symbiosis between the geekier—often older—groups of hard-core players who lead the way in adopting new forms and innovations, and the less intense, faddish engagement of average kids (pp. 277–281). The consumption–production cycle of popular media mix content like *Yu-Gi-Oh!* and *Pokémon* is driven forward by this dynamic interplay of connoisseur and popular markets. Athough these markets are somewhat distinct, they also speak to each other, as certain kids gain local expertise and notoriety even among more casual players, or other kids gain access to the adult gaming communities. The media mix fuels this interplay, leading to new anxieties and efforts to regulate children's behavior. Ultimately, the media mix supports a complex set of environments and markets that give rise to new kinds of contact zones, tensions, and cultural politics surrounding childhood.

The cultural establishment, represented by the voices of parents and educators, and by Konami's official marketing discourse, maintains a boundary between the sanctioned consumption of *Yu-Gi-Oh!* content by children and certain unsanctioned forms of consumption by adult core gamers and collectors. It promotes the idea that the legitimate place for children's entertainment is in the home, under the surveillance of parents, and that the legitimate economic relation is one of standardized commodity relations, distributed through mainstream channels such as convenience and toy stores. Konami has been rumored to have tried, unsuccessfully, to pressure some card shops to stop the sale of single cards. They have also tried to exclude the members of at least one core gaming team from the official tournaments. Mainstream publishers of manga are similarly quick to distance themselves from the amateur market, which they see as derivative and unsavory, catering to the cultural margin. In some rare cases, artists have transitioned from amateur to professional status, but the amateur market today is generally quite distinct from mainstream markets and industries (Kinsella, 1998; Schodt, 1996).

In her work on *otaku* and the "cultures of cute" in Japan, Sharon Kinsella (1998) describes discourses in the 1970s and 1980s that correlated popular media and consumerism with the infantilization, irresponsibility, and materialism of youth. While girlish pop idols and cute character goods are appealing to the Japanese mainstream, *otaku* represent what some consider a pathological extreme of adult engagement with kids culture (pp. 290–294). *Otaku*-

identified cultural forms became a source of moral panic in the late 1980s and early 1990s, after Miyazaki Tsutomu was arrested in 1989 for the abduction and murder of four small girls. His bedroom was walled with manga and videos that evidenced an obsessive interest in young girls and associated cute cultures. Through the image of the obsessive *otaku,* media fans became associated with social pathology that mirrored their marginalized status in economic and cultural life (Kinsella, 1998). Although there are efforts to reclaim a positive image of *otaku* as media savants (Okada, 1996), and although the term has been taken up with more positive valences in the United States and Europe (Eng 2001; Greenfeld, 1993; Levi, 1996; Napier, 2000), it is still associated with social dysfunction for the Japanese mainstream.

Although few parents had problems with *Yu-Gi-Oh!* games and card trading among peers, most were nervous about children participating in adult gaming and collecting circles. In contrast to most critiques situated outside Japan, notably those focused on the consumerist logic of *Pokēmon* (Buckingham & Sefton-Green, 2004; Yano, 2004), Japanese parents did not exhibit much concern with their children's participation in mainstream commodity capitalism. Instead of battle lines being drawn between parents and industry, Japanese parents tend to align themselves with mainstream capital against the subaltern practices of unregulated and unpredictable *otaku* economies. None of the parents I interviewed condoned buying and selling single cards at professional card shops, although some turned a blind eye to occasional visits. In particular, they did not like the idea of their kids selling and buying rare cards for high prices in the professional networks. Part of the problem was price and the fanning of consumer desire to levels well beyond what children could manage financially and psychologically. One parent describes her perspective on monetizing the value of cards:

"If my child can understand the meaning of spending 5,000 yen on one card, then it would be okay. With 5,000 yen I could buy this, and this, and this. But instead, I want to buy this one card. Understanding this trade-off is quite different from just buying it because he desires it."

There is also the fear of exploitation—that children are bound to lose in financial negotiations with adult collectors:

"This may be a strange way to put it, but I explain it this way. I know not all these guys are like this. But what if some strange guy came up to you and said, 'Check this out. This is really rare. It really could be sold for 10,000 yen, but just for you, I will

sell it for 1000 yen.' What if you buy it, and later find out that it wasn't rare at all. Could you really make that judgment? And could you take that responsibility?"

Card vendors also see relations with kids as a difficult border zone. Some see kids as a legitimate market for their goods. Some admit that there are collectors who exploit kids by selling counterfeit cards. Others prefer not to sell to kids because they see them as unreliable and irresponsible in their financial transactions. Most card shops prevent kids from selling cards, although buying is generally not a problem. Buying, trading, and selling over the Internet, however, remains a significant gray zone where different expectations of conduct often come into conflict. Cards are sold on brokered auction sites such as Yahoo or eBay, as well as on private sites of individual card traders. One card trader I spoke to described a problem he had in an Internet trade with a middle-school student who sent him the wrong card. What was most galling to him was the response of the parent when he visited the child's home to try to discuss the problem: "The father took the attitude that his son had done nothing wrong. After all, he is just a child. And he had his wallet out ready to resolve the problem with cash." While the adult trader felt it was an issue of honor and responsibility and that the child should be held accountable, the parent insisted that *Yu-Gi-Oh!* was "mere" child's play. The father also assumed that the trader was primarily motivated by mercenary concerns independent of his engagement with the game and desire for the cards themselves.

Overall, the adult collectors I spoke to had a less innocent view of childhood. In the words of one hard-core gamer, describing children's often desperate efforts to get the cards they desire, "Kids are dirty." This same gamer described with some distress how he used to share cards and information with neighborhood kids. Soon, however, false rumors spread that he was selling cards, and parents asked him to stop talking with their children. The dynamics between parents, children, and adult gamers occasion a familiar protectionist impulse toward childhood and its maintenance as a separate space. This wish finds itself increasingly at odds, however, with media mixes that introduce children to subcultural, mixed-age social arenas beyond the surveillance of protective adults such as parents, teachers, and the sanctioned media industries and markets. A rising generation of young adults, at least of the *otaku* variety, tends to see a more porous boundary between childhood and adulthood, and childhood subjectivity as an attractive arena for culturally productive activity. Although *otaku* continue to be objects of

suspicion, adult engagement with childhood products is steadily becoming more pervasive in Japanese society.

Notwithstanding critiques by cultural commentators from both inside (Doi, 1973; Okonogi, 1978) and outside Japan (Kerr, 2001), the popularity of Japan's cultures of cute, epitomized by manga, anime, and character goods, continues unabated. Such cultural products have become a central element of Japan's "gross national cool" (Iwabuchi, 2004; McGray, 2002) in the transnational arena (Allison, 2004; Kinsella, 1995; Napier, 2000). The culture of cute is by no means restricted to children: Approximately one third of all character goods in Japan are consumed by adults age 19 and older (Character Databank, 2000). In his study of advertising images in the sixties and seventies, Thomas Frank (1997) describes what he calls "the conquest of cool": the appropriation by marketers of hip, youthful, countercultural images that broadcast resistance to the "square" mainstream of work and discipline. I believe we are seeing a similar process of the conquest of cute in the commodification of images and products of childhood.

Whereas in the United States identification with cute culture is generally considered effeminate for young men and adolescents (S. Tobin, 2004), in Japan there appears to be a growing willingness to embrace childhood and cuteness as a source of alternative adult identities of both genders. In his discussion of *Pokémon* and gender identity, Samuel Tobin (2004, p. 253) points out that "toys and TV shows are not inherently appropriate for certain ages or genders.... Instead...these factors change with time." Social, cultural, and historical context naturally plays a large role. Moreover, as my *Yu-Gi-Oh!* work suggests, such shifts can be traced within much broader cultural formations. In the current moment in Japan—and arguably with increasing frequency outside Japan—childhood play is being imagined by children and adults as a site for alternative forms of symbolic value and economic exchange. In part, this is a form of refusal of or resistance to "adult" values of labor, discipline, and diligence and institutions of school and workplace. This valence is central, for example, to Kinsella's (1995) account of the popularity of child-identified and cute products among young adults.

Although studies of children's culture have recognized the agency of kids even in the face of stereotypically passive TV-centered consumer cultures (Jenkins, 1998; Kinder, 1999; Seiter, 1995), the current media mix represents a stronger integration of this agency with the design of the media apparatus. Childhood agency can be performed as well as imagined through

the new combination of digitally inflected media mixes and peer-to-peer forms of cultural and financial trafficking. This alchemy has created zones where adults and children participate in communities of rich cultural production and exchange. Media industries have found a new market in both kids and adults who are attracted to a certain *depiction* of childhood, one that is distinguished from and resistant to certain structures of adult society without being depicted as inferior. Symbolized by tiny Yugi's triumphs over corrupt adult society, childhood play is represented as mobilizing the power of the margin.

Although it would be easy to dismiss these imaginings as the false liberatory fantasies of people who will remain, in reality, resolutely marginal and disenfranchised, we can also see these new cultural productions as part of a growing significance of the margin when augmented by digital networks. The media mix of *Yu-Gi-Oh!* does not end with the player's interpellation into the narrative fantasy, or even with the recontextualization of the imagination into local knowledge, but extends to the production of alternative material and symbolic economies that are informed by, *but not mediated by,* the corporate media apparatus. In other words, these practices produce alternative cultural forms that are disseminated through everyday peer-to-peer exchanges below the radar of commodity capitalism; they are a mode of cultural production that does not overthrow capitalism, but operates in its shadow, through "cultures of insubordination" (Sundaram, Chapter 4, this volume) that both rely on and disrupt the dominant mode.

It seems likely that the mainstream will continue to characterize these practices and imaginaries as socially dysfunctional, psychologically immature, and out of touch with reality. At the same time, the ethic of the *otaku* and the entrepreneurial kid-consumer seem to presage a technosocial shift, much as the rise of "geek chic" in the past decade was tied to a shift in the mainstream perception of a marginal subjectivity. The technological tinkering, amateur cultural production, and media connoisseurship enacted by kids and *otaku Yu-Gi-Oh!* fans is a subjectivity with loose analogs in other digitally mediated cultural spaces. The *otaku* resemble the Euro-American hacker or geek, or the player-producers described by T. L. Taylor (Chapter 7, this volume). At the same time, the strong identification with childhood, remix, and revaluation cultures ally *otaku* more strongly with specific phantasmagoric cultural arenas rather than with digital technology per se. Also, importantly, these cultures are more strongly associated with the socially disenfranchised

and subaltern—children and working-class youth—and thus represent a greater distance from elite centers of cultural and technological production.

Working with highly technologized and phantasmagoric social sites like *otaku* practices and the media mix for Japanese children suggests a differently inflected *research imaginary* for those of us who study media technology. My effort has not been to suggest that we have seen a decisive shift in technologies of the imagination, but rather to evoke an emergent set of research questions tied to the new technologies and practices of a rising generation, and to an increasingly transnational network of *otaku* media hackers. Just as electronic media and globalization have forced a rereading of more traditional social-scientific concepts such as place and locality (e.g., Appadurai, 1996b; Gupta & Ferguson, 1992; Meyrowitz, 1985), media mixing invites attention to social and cultural processes in all media, both old and new. Media mixing involves attention to a highly distributed and pervasive imaginary that spans multiple material forms, an imaginary that is massive, but not mass. In addition to an analysis of the relation between reality and text, production and consumption, media mixing also demands that we query the relation *between* differently materialized and located texts, exploring issues of intertextuality, multiple materialities, and a distributed field of cultural production. Perhaps most important, the media mix demands a continued attentiveness to the politics, productivity, and creativity of the everyday, as technologies of the imagination populate even the most mundane corners of our daily lives.

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notes

1 Although some girls engage with *Yu-Gi-Oh!*, it was decisively marked as boys' content, unlike *Pokémon,* which had a more mixed-gender identity (Tobin, 2004). Unlike the "cute" style of *Pokémon* (Allison, 2004), *Yu-Gi-Oh!* is stylistically closer to medieval and occult fantasies, often with grotesque and scary monsters. Limited space prevents me from describing a case of a girls' media mix and, consequently, from taking the topic of gender difference head-on. But I would note that, like most kinds of technology-oriented media culture, the trends in anime media mixes are being set within boy-identified media and filtering over to girls.

2 *Virtual reality* is a term that gained currency in the early 1990s as a way to describe immersive, computer-generated virtual environments that a user "entered" through technologies such as stereoscopic goggles and instrumented gloves. *Augmented reality* is a more recent term describing technologies such as see-through displays that juxtapose digital images and real-world objects and environments.

7 Pushing the Borders: Player Participation and Game Culture

T. L. Taylor

Games are typically thought of as closed systems of play in which formal rules allow players to operate within a "magic circle" outside the cares of everyday life and the world (Huizinga, 1955). This rhetoric often evokes a sense that the player steps through a kind of looking glass and enters a pure game space. From *Monopoly* to *Final Fantasy,* commercial games in particular are often seen as structures conceived by a designer and then used by players in accordance with given rules and guidelines. Players, however, have a history of pushing against these boundaries, whether through feedback processes that change the game over time or, as Mizuko Ito (Chapter 6, this volume) suggests, via their engagement with games within an extended set of linked media practices and social identities—a subject that this chapter explores as well. However absorbing the game experience proves itself to be, player culture has never existed in a completely rarified space: We can see all kinds of players—multiuser, first-person shooter, console, simulation, classic—pushing back at and tweaking the structures of play they encounter.

As with critiques of the dichotomization of online and offline life, the line between game and "real" world often becomes blurred. As players blend game and nongame space, they simultaneously complicate preconceptions about authentic or legitimate play. Players do not simply adopt the rules of the game as given but regularly create their own achievement paths and make sense of the frames of play in ways not always prescribed by the designers. Indeed, in many massively multiplayer online games (MMOGs) fundamental structures of the game rely on active player populations who participate in everything from testing for product bugs to creating new content after launch. MMOGs, in particular, seem to foster a climate in which the typical hierarchy of designer and user is problematized—where players do not simply adopt given game worlds but find themselves in positions to support, challenge, and extend the structures they encounter. New digital technologies clearly facilitate these roles, whether in terms of communications networks that support dispersed player communities and permit game updates and modifications to circulate; or in terms of the potential openness of game architectures to modification via available game source code or content editing.

This two-way interaction characterizes much of digital culture, from editable formats for digital music and video, to Internet distribution mechanisms, to the open source software movement, to cite a few examples. In this context, it is perhaps surprising that computer games are so routinely captured by arguments about (and fears of) mindlessness and passive

consumption (Dorman, 1997; McVeigh, 2001; Stallabras, 2003). Arguably, this is partly an effect of digital convergence, that is, of the increasing mediation of media experience through the screen, and of the resulting transfer of older arguments about screen culture to the new game spaces. Although computer games, like other screen media, can be vehicles for narrative and scripted action, they also by definition imply performance—the creation of spaces that call the player or players into action (and interaction). Despite corporate fantasies (and emerging technological possibilities) of a completely controlled media landscape—see Robert F. Nideffer (Chapter 12), Tarleton Gillespie (Chapter 15), and Joe Karaganis (Chapter 16) in this volume—there is ample evidence that electronic games can and do support forms of experience that extend this performative engagement. If we are to understand and, perhaps, value the creative dimensions of that experience, we need models of the complex, often messy scenes that emerge when users find themselves in the role of not simply active consumers but also key producers in the media they engage. We need theories that locate these practices as simultaneously creating vibrant, meaningful cultural forms and also situate them within a particular postindustrial moment infused with global media products.

This chapter explores the ways in which participatory practices by players extend game space beyond its literal confines, and how those moves are in turn either supported or contested by game companies and designers. Rather than just suggesting that players tangentially contribute to games, I argue that, in many cases, playing digital games and participating in their broader culture is possible only through the elaborate production of auxiliary tools, websites, social networks, structures, and practices that are created and maintained by the players. Playing computer games regularly puts users in the position of relying on vast networks of resources, including game hints, cheats, and walkthroughs, community newspapers and message boards, ancillary game applications, and information and knowledge repositories. To recognize the ways in which the structures of participation within game culture are built on player-created content typically seen as lying *outside* the bounds of the formal system is to refigure not only our understanding of play and games but also how we conceptualize the identities of players and designers. What we see when we look at this more complex picture of participation is a system in which the line between creator and consumer is blurred and in which the de facto ownership of game space can come to lie increasingly in the hands of productive players.

De jure ownership is usually a different story, however, and the evolving differences between the two have produced some notable conflicts among corporate owners and between corporations and players. As players have emerged as key participants in the creation of game culture, computer games have become full-fledged global media products, subject to the same forces of corporatization and consolidation that have transformed the broader media arena. On the production side, the results are dramatic. Independent developers continue to struggle to keep up with large studios while game publishing and distribution is now dominated by a handful of companies such as Electronic Arts, Microsoft, Sony Entertainment, Vivendi, and Ubisoft. In this climate, players find themselves negotiating an often thorny terrain in which spontaneous cultural participation intersects with complicated corporate and legal interests. Depending on where you look and who you listen to, these developments can be read as either signs of creative growth or as the steps toward a much more tightly controlled game future. What follows might be thought of as early indicators of these outcomes—fragile, still contested, and hinting at choices to be made.

content creation and technical interventions

One of the most interesting forms of player intervention in the computer gaming experience is the creation of software that enhances or modifies games. Sue Morris (2004) has suggested we think of such interventions as signaling the emergence of players as "co-creative" media producers. Such work situates games and player communities within a long history of user innovation in software development, from the production of free/shareware to the development of entire operating systems. The attention the open source movement has received in recent years highlights the importance (and long-standing tradition) of these unpaid developers in the creation of computer technologies. Such participation often constitutes a central—not peripheral—axis of innovation, not least because it is a driving force in the education, training, and socialization of new innovators (Burnham, 2003; Dyck, Pinelle, Brown, & Gutwin, 2003; Herz, 1997; King & Borland, 2003; Ratan, 2003). Despite the proliferation of systems that are either locked down or maintained under strict proprietary guidelines—such as the closed-box formats of game consoles like the PlayStation 2 or opaque engines that cannot easily be modified—a wide range of user communities continues to push at the boundaries of open and closed systems alike and actively insert

themselves into the production process. Indeed, the term "user" may not adequately describe the kind of agency at work in this configuration.

In game worlds, this activity takes many forms, reflecting the wide range of expertise and degrees of engagement that players bring to bear. Sometimes, new objects can be created for the game space, as in the case of *The Sims,* which allows players considerable latitude in creating and sharing the "material culture" of the game. These can range from the mundane (new furniture) to something like the "tiny.signs.of.hope" project that created antiwar images for importation into the game world (Poremba, 2003). "Modding" is a similar practice that describes the work of player communities in the production of new content, usually the creation of maps, weapons, and scenarios for various first-person shooters (FPS) like *Unreal Tournament*. Modding communities have long been a vibrant part of computer game culture, extending the lives of some games well beyond their expected shelf life. Hector Postigo (2003) has suggested that modders create a tremendous amount of labor value in their activities, doing the work of large numbers of developers. He notes that their activities fit into a broader economy in which social recognition creates powerful incentives, including financially convertible rewards in the form of entry into the game industry. This emergent symbolic economy, sometimes called a "gift" economy, is one of the most distinctive features of digital gaming culture and often creates a very close and fluid relationship between game companies and their customers. The catalogue of player-produced innovations reveals a startling amount of user investment in games. A handful of game developers, in turn, have altered their practices and game designs to take advantage of this relationship.

Some player production extends beyond content creation to the very structure of the game, involving changes to the game dynamics or user interface. The massively multiplayer online game *Asheron's Call,* for example, benefited enormously from the enhancements its players made to the user interface and functionality of the game. Players produced coded modules that were circulated via the Internet. Once installed, they gave access to in-game maps and new trading mechanisms, and generally altered and enhanced how players interacted with a wide variety of game information. In the case of *Asheron's Call,* these modules were built via a piece of noncommercial software, Decal, which allows third-party tools to be added to the game. Layered development of this kind is increasingly common: Tool-building applications support the further development of modularity. All are promoted through

word of mouth and distributed through networks of websites and message boards. The development of these enhancements has even led the second version of the game, *Asheron's Call II,* to include third-party plug-in support for modding via a manager in the engine itself (Rhody, 2003). *World of Warcraft* has most recently picked up on this technological thread by allowing players to produce add-ons for the game that can radically alter not only the interface but user experience of the space (Taylor, 2006c). The number of add-ons produced for the game over the last several years totals well over a thousand. Notably, a number of player-introduced features in these add-ons have found their way back into official Blizzard updates to the game. This kind of full-circle development process, driven by player initiative, is now a common feature of multiuser game design. Although the hard work of the original designers should not be underestimated, either in terms of the raw investment of time (Ahearn, 2001; International Game Developers Association, 2004; Kline, Dyer-Witheford, & De Peuter, 2003; Postigo, 2003) or the continued importance of auteur-driven game design, this kind of participatory activity should make us reconsider our notions of what constitutes the actual game, the "real" designer, and what it means to be a player in this space.

Several companies have met the challenge of active player communities by working to enfranchise them as lay designers. By including tools to modify the game, by organizing competitions for new levels and maps, by hosting centralized distribution channels for modding activity (as in Valve Software's *Steam* application), and even by involving players in the production of game content (the *Neverwinter Nights* website, for example, boasts an impressive catalogue of downloadable player-created textures, creatures, and objects), companies foster and draw on a creative user base that is invested in keeping the game fresh and interesting. Indeed, some spaces are built upon the premise of player production. Games like *A Tail in the Desert* not only directly involve players in creating the storyline of the game, but allow them to mandate that the designers implement certain kinds of changes to the game itself. And using language that resonates with the ethic of many old-school text-based MUDs (multiuser dungeons), *Second Life*'s Cory Ondrejka (2003) states that,

creating a defensibly real, online world is now possible if its users are given the power to collaboratively create the content within it, if those users receive broad rights to their creations and if they can convert those creations into real world capital and wealth. (p. 4)

Extended to include the real-world hours players spend beta-testing games, a pattern emerges of a vast volunteer labor force of lay game designers, quality assurance checkers, and bug testers. Although some pursue these activities in the hopes of landing an actual job within the industry, many do it simply for the love of the game, the pleasure of creating and distributing their work, and the social recognition that follows.

Some very successful games have been driven by player development, including the enormously popular *Counter-Strike* (a modification of the game *Half-Life* by college-student player Minh Le). The field of networked gaming, especially, owes many of its innovations to channels outside commercial game development. Networked FPS games like *Counter-Strike* and *Quake* create unique social challenges that are often addressed (at least initially) within the game community. There is pressure, for example, to ensure that all players are operating within shared technical guidelines. Cheating is one of the major worries: Player communities generally try to ensure sure no one is benefiting from special programming hacks or tricks that can unbalance the game. This concern led to the creation of PunkBuster, an application created by a group of player-programmers to run alongside *Counter-Strike, America's Army,* and other games, which can verify to other systems that the player is abiding by approved guidelines (and not using ancillary hacks and cheats). PunkBuster and similar programs have become so successful within the community that many servers (hubs where players meet up and initiate games) refuse entry without its use. PunkBuster has even been included in various official game distributions.

Constraints are also—and, arguably, increasingly—at work, however. Although modders and content producers exemplify the new player-programmer roles, the kinds of creative practice associated with these activities can be regulated. Andrew Mactavish (2003), for example, has described the ways that modding communities are both supported and kept in check via software and end user license agreements (EULAs). Bundled tools or authorized development kits, for example, provide the ability to easily integrate new content with the game system, but they also have the power to enforce particular standards and aesthetics. As Robert F. Nideffer notes, "The game engine becomes not simply a piece of software, but something that reflects and embodies the cultural conditions indexical to both the developers of the system, as well as the end users of that system" (Nideffer, Chapter 12, this volume, p. 200). Although such software serves the interests of the players

and the game, it also imposes a form of low-level regulation (Taylor, 2003). Centralized distribution systems that provide access to larger player bases and allow players to share their creations also serve as mechanisms for vetting or rating player-created content. Simple inclusion in (or exclusion from) the distribution system can work to signal authorization and legitimacy of particular production interventions. As player-produced content gets funneled into "authorized" distribution mechanisms, previously informal systems of community governance (whereby players rate each others' creations) become more subject to institutional regulation.

At times, such auxiliary applications take on particularly contested meaning, as in the case of the program ShowEQ, an application designed to give *EverQuest* users special hidden game information. Seen by Sony Online Entertainment as an illegitimate game addition (players can be banned from the game service for using it) and by many players as simply a device for cheating, ShowEQ is nonetheless a fairly innovative piece of software that extends the boundaries of the game outside its authorized confines: The program allows the user to have detailed map information about monsters and items they would otherwise be unable to see. More extreme are server emulator programs, which completely bypass the formal paid subscription servers typically required to play the game and give users an opportunity to play the game outside the administration of corporate owners. Both ShowEQ and server emulators point to ways in which player interventions can push against not only design intentions but also, sometimes more significantly, the business models of the companies who keep them running. The stakes of defining what constitutes *legitimate* player production can become quite high: Game companies have already shown their willingness to take legal action against player-producers who are perceived as threatening the commercial value or design of the game. In a contest of vastly unequal financial resources, often the simple threat of legal action—regardless of the merits—is enough to police these boundaries (Taylor, 2006a).

networks and knowledge

Beyond software additions and in-game content production, there are many ways in which players extend, enhance, and augment games through the creation of social networks and knowledge databases. These social networks are constituted in part through a form of community problem solving. As James Paul Gee (2003) has argued, they describe processes of thinking and

reasoning that are not only social but also distributed and enduring. Frequently such structures become instrumental to successful game play. Although game designers sometimes think their game is a complete and total entity that the player can interact with unhindered by "external" factors, in fact many computer games produced today are virtually unplayable without "nongame" elements.

One of the most widespread forms of participatory activity in game culture is the production of elaborate knowledge databases and information about the game. Large persistent world games like *EverQuest* and *Star Wars Galaxies* are excellent examples of game spaces that cannot be mastered by single players. The design of the games themselves reward—and often require—sociality and reliance on others. Players often transfer this reliance outside the strict boundaries of the game (Jakobsson & Taylor, 2003). Detailed mapping sites, databases cataloguing the minutiae of the world, and walk-through or quest guides are some of the most common interventions. Websites, message boards, and wikis dedicated to all aspects of the game spring up and give players an opportunity to share and catalogue game elements far beyond what introductory game manuals provide. Such activity is not limited to only the obviously social games. Tip books, guides, and walkthroughs have become standard—and often required—gaming paraphernalia. Unofficial player-produced help guides are sources of status and community among players. Officially sanctioned guides are part of the extended product lines associated with games. These networks of official and unofficial support are intentionally fostered by high levels of difficulty, complexity, and numerous discoverable secrets in the game. Other forms of community support involve extending the game into other less-served communities—"porting" from one operating system or machine to another (e.g., from Windows to Linux), or into other languages (e.g., English into Chinese; Sun, Lin, & Ho, 2003).

For the most part, these endeavors operate with tacit support from game companies. They constitute free labor and affective engagement, and generally only enhance the attractiveness and playability of the game. Edward Castronova (2002) goes further by showing the ways in which actual economic value is created by the activity of the players, not only within the game space but offline through the buying and selling of in-game items. Because game worlds generally have reward structures that operate as de facto economies (sometimes complete with systems of labor and trade), and because objects and characters in the game world are often (albeit illegally)

transferable to other owners (e.g., the password for a character account can be sold), an exchange rate between dollars and in-game rewards can emerge—as in fact happened regularly when players began selling their laboriously developed characters or items and currency on any number of auction sites.

When activity is not manifestly aligned with game company interests—especially when player-producers compete with official services or leverage economic value created in-game—the contested nature of these borders comes into sharp relief. Whether it concerns player ownership over the in-game experiences (and the right, for example, to retell those experiences in another medium, as in the case of fan fiction) or user protests about the quality of the service, game space is often disputed terrain (Brown, 1998; Lastowka & Hunter, forthcoming; Taylor, 2006a). *The Sims Online* (TSO), for example, had a growing community of players who contributed information about the game through websites and discussions. When an article was published by an online community newspaper, *The Alphaville Herald,* suggesting that underage avatar prostitution was occurring in the game, the editors of the web-based paper found themselves involved in a complicated battle over how "real-world" notions of publicness and freedom of speech mapped onto the game space. Sensitive to bad publicity and potential liability issues, Electronic Arts (EA) asserted tighter control of the boundary between in-game and out-game. In particular, it accused the editor of the paper, Peter Ludlow, of linking from his in-game TSO player profile to the out-game online newspaper, which in turn linked to cheat sites. This awkward chain of affliations resulted in a terms-of-service violation and Ludlow being banned from the game (Harmon, 2004). This incident generated considerable debate within the community (with players taking both pro- and anti-EA positions). Ultimately, it served as notice that the company retained "sovereignty" over the game world, with the right to dictate flows of information and restrict the complex moral encounters it set into play. Similar incidents have occurred in other games as well (Taylor, 2006a) and serve as a reminder that the rights of player-producers are defined through contracts—EULAs—and not by real-world assumptions about citizenship.

The policing of game boundaries, of what constitutes legitimate play and cheating, and more generally who controls knowledge about the game, is common and comes with an increasingly well-developed repertoire of enforcement strategies, many of which raise controversial free-speech and intellectual property issues that remain untested in the courts. It is a

particularly poignant strategy, given the reliance of game companies on their players to develop active (and by extension, promotional) grassroots communities for the game. As in-game experience becomes central to the lives of many individuals, and as the games foster an increasingly broad range of associated activities, these contractual arrangements bleed into other areas of life, following individuals and challenging what they can do with their online lives.

user-designers: the future of participatory practices in computer gaming

What does it mean, then, to seriously account for player-producers? At one turn we see active users, engaged in meaningful ways with the artifacts they encounter, pushing back against simplistic notions of gaming as a form of passive media consumption. At another we see strategies of containment and control, articulated through company-defined determinations of copyright infringement, contractual violations for cheating, and general monitoring for behavior deemed "unruly." Players create specific interventions in game spaces through their practices, both technical (via tools, applications, and distribution systems) and social (via networks, systems of reputation, norms, and patterns of interaction with actual game producers). The boundary work undertaken by both parties is complicated and rife with political challenges, especially when game companies remain invested in a narrow model of whose game it really is. As games become more popular, these political challenges are likely to grow, introducing a new dimension into the current struggle over the definition of cultural participation and publicness in the digital era. More modestly, my challenge is to understand the significance of these activities in three arenas: within the emerging field of game studies; with respect to game design and production; and, more broadly, in terms of player identity and culture.

critical game studies

Scholarly work on computer game theory has, especially in its early years, tended to emphasize designer- or system-centric views of what constitutes the game. It is not that players are ignored, but that the essence of the game is often seen as consisting of formalized structures and rules (and the larger system or game engine that enacts them). Emergent player behavior, while certainly seen as interesting, is often absent from core definitional questions

(the "what is a game" issue). Such questions are usually resolved from a perspective that subtly privileges the system over the user.

Game designers Katie Salen and Eric Zimmerman (2004), for example, while providing important critical interventions by suggesting designers take seriously and tap into the power of "open culture," still situate player-producer activities in a very particular way, writing, "When players become producers, their activities as players fall outside the magic circle and largely take place in spaces external to the game. These activities are a form of metagaming" (p. 540). This is not unlike Jesper Juul's (2003) model, in which the strict definition of what constitutes the game rests in part on a model in which the "valorization of outcomes" primarily resides in the system's formalization of goals (versus those of the player): "Open-ended simulations like *Sim City* fall outside [the inner circle of 'games' and into 'borderline cases'] because they have no explicit goals" (p. 40). When many of the most popular games prove difficult to fit within this logic, we should perhaps reconsider our notions of center and periphery.

Games like *Sim City* and *EverQuest* too often end up in liminal categories because it is the player, not the system, producing central goals. Although much of the move to understand the structural features that constitute games comes from a reasonable attempt to disentangle the form from simple recapitulation into filmic and narrative structures, I want to caution against creating theoretical models that do not take into account, at a definitional level, player agency, meaning systems, and activity—models that produce a world of "borderline cases." Salen and Zimmerman note elsewhere in their work the dangers of looking solely at the formal rules of a game system and "the hypnotic allure of elegant mathematics and embedded logic" (ibid., p. 302). And their call to consider the nature of play and culture can take us one step closer to a more inclusive model. Ultimately we need a formulation of engagement with computer games that interweaves the technological with the social, the structure and technology of the game (as agents) with the complex position of players. We also need ways of talking about productive activity that are not simply bound to what looks designerly or fits easily in a box of content production, but includes the always already transformative power of action and ludic performance. This is certainly difficult theoretical ground as it challenges us to not bracket off system from user, or to assign actual players and their activities as outside of the formal structures they are, indeed, constituting and embedded in.

I want to propose that before we call the narratology–ludology debate—one that seeks to understand games as primarily narratives or games as ludic structures in and of themselves—an intervention that settles in any way our understanding of what games are, we make sure that we have theoretical and methodological tools that reckon with player-producers and lived player experience. Such an orientation matters because it allows us to pay serious attention to structures of participation, to critically examine the relationships between systems and culture, and to understand the ways that meaning and activity intersect with formalized conventions. To include players and the kind of activity I describe in this chapter as *definitionally and functionally central* is to enrich our notion of what constitutes a game and to understand the role games are increasingly playing in the redefinition of public and private space, knowledge, lives, and identity. Rather than seeing *actual* players and their activity as a kind of sidebar (or metaconstruct) to an investigation of games, I would suggest that critical games studies need to take into serious account the intersection of structure *and* player culture. This is not a call for a shift to a kind of simple player-centered rubric but instead a proposal for work on the messy relationships between systems, producers, and users—to understand the assemblage that is games and play.

the design and management challenge

It should come as no surprise that game designers also confront these issues and would arguably benefit from more careful consideration of the extended gaming and social spaces they are creating. Among designers, there is certainly some acknowledgement, especially within the MMOG community, that the production of vibrant player culture is crucial to the success of a game. This recognition operates in tension, however, with the kinds of controls designers often feel obliged to enact. These can range from technical infrastructures (in which the fear of hacks and cheats leads to stringent clampdowns on data streams and client programs) to efforts at social control (when concerns over a game's image or brand is seen as potentially threatened *by* players). Companies like Linden Lab (makers of *Second Life*) are attempting to give their players a stake in ownership of the space by granting them intellectual property rights over their content production. John Banks (2003) similarly marks out the innovative ways model train and simulation enthusiasts were enlisted in the *Trainz* community for both the creation and maintenance of the product. Likewise, the MMOG *Star Wars Galaxies* was notable for its

solicitation of player input during the design and prelaunch phase, clearly recognizing that enfranchising existing *Star Wars* devotees could help the game achieve both initial critical mass and long-term fan support. Of course, when designers take user engagement seriously, users sometimes come to feel they have a real stake in the product—even a proprietary stake established through use. The consumers—and sometimes large groups of consumers—can become de facto, if still largely disenfranchised, stakeholders in the game space, setting up dynamics of the kind we have discussed above.

The issue, then, is not just how to encourage player-produced content. It is also to fundamentally think about, fully acknowledge, and integrate into the game structure the engagement and strong commitment of player-producers and the sense of investment that often follows (see also Taylor, 2006b). Raph Koster, chief creative officer for Sony Online Entertainment, has written an imaginative exercise entitled "Declaring the Rights of Players" (Koster, 2000). It is striking in the ways it envisions virtual world users as citizens of that space, with due attendant rights. As a thought experiment, it is a great example of the kinds of things we might have to consider when we reformulate passive consumption into active engagement. In Article 2 of the document, for example, Koster proposes that,

The aim of virtual communities is the common good of its citizenry, from which arise the rights of avatars. Foremost among these rights is the right to be treated as people and not as disembodied, meaningless, soulless puppets. Inherent in this right are therefore the natural and inalienable rights of man. These rights are liberty, property, security, and resistance to oppression.

Such a formulation would have radical implications—for avatar ownership, freedom of speech, intellectual property, game world governance—if taken seriously. Koster knows this and does a good job pushing the debate forward by getting people to wrestle with some of these basic questions. Even within these debates though there is often too little attention to the formal structure of the "code of conduct," the social contract the users agree to each time they enter the game. And yet this is central to player-producer concerns. Who determines the rules? Who decides what the real boundaries and structures are? Who creates the meaningful culture of the game space? Although it is not uncommon to hear the reply, "Whoever owns it!," as we can see from the previous discussion, this is an insufficient formulation. Designers who take active participation seriously run into deeper and potentially troubling

questions about the openness and boundaries of the game. We currently have a range of ways—some progressive, some reactionary—in which these issues are being addressed by the designers and administrators of game spaces. How they negotiate this territory, and how their approaches are reconciled with corporate legal and marketing departments, is sure to be a central factor in the future of digital cultural participation.

locating player communities and the status of cultural production

The kinds of activities we see in computer game culture follow a much longer history of active media engagement. Henry Jenkins (2000) maps out the ways in which the "interactive audience" resides somewhere between the status of a powerful marketing concept and that of a "semiotic democracy." Sal Humphreys (2003) similarly suggests that *EverQuest* players, "in their passionate, voluntary and willing participation hold particular kinds of power as well. The reliance of Sony and other game developers on player communities for content creation . . . means they are subject to the goodwill of these player communities" (p. 15). As we begin to understand gamers as not simply operating under the thumb of media owners but also engaged in a much more nuanced relationship, we must ask whether older models of resistance–co-optation or consumer–producer still hold. Mizuko Ito's research on *Yu-Gi-Oh!* cards (Chapter 6, this volume) points to the complex nature of contemporary media engagement. She notes, "Hypersocial exchange is about active, differentiated, and entrepreneurial consumer positions and a high degree of media and technical literacy, rather than the one-way street connoted by the term mass media or mass culture" (p. 97).

Some note that this potential newfound power has a distinct location in a broader postindustrial economy, one that relies on "free labor" and flexibility (Kline, Dyer-Witheford, & DePeuter, 2003; Postigo, 2003; Terranova, 2000). Although such cautions against polarized approaches to production and consumption are warranted, we are still probably well served, in this era of class action lawsuits by AOL and Ultima Online volunteers, to consider how free labor and the gift economy embedded in game culture intersect with new forms of capital. Central to this inquiry is a consideration of how game structures recognize, legitimate, facilitate, ignore, surveil, and control player activity. It is one thing to tap into the power of the distributed flexible volunteer ethic, but corresponding systems of recognition and accountability

must be in place. While *EverQuest, World of Warcraft,* and other games bear witness to an emergent system of meaningful user engagement, these activities continue to operate under legal and ownership rules that rarely give due regard to this form of creativity (Boyle, 1996; Coombe, 1998; Lessig, 2001). As gamers continue to make their way through these spaces not simply as players, but as nascent stakeholders, their productive activity will need to be creatively and progressively supported—by designers and researchers alike.

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8 None of This Is Real: Identity and Participation in Friendster

danah boyd

Stepping into a chic San Francisco café in June 2003, I was struck by the number of patrons whose laptops were directed at Friendster.com. When I walked into a used bookstore later that afternoon, the hipster clerk was surfing Friendster. As I watched, two customers engaged her in conversation about Friendster. Together, they surfed the service to find common friends while discussing the recent popularity of fake characters on the network ("Fakesters"). That evening, at an electronic music venue in the warehouse district, I overheard conversations about Friendster every time I approached the bar. Afterward, a voicemail was waiting for me—a friend had gone to see an indie rock band whose lead singer encouraged everyone to join and be his "Friend." Seemingly overnight, Friendster had swept through my San Francisco social circles.

Friendster is a social network site that invites people to post profiles detailing a range of personal information, and to link those profiles to others on the service ("Friends"). Soon after its launch in fall 2002, it became a phenomenon among large numbers of educated 20- to 30-something urban dwellers, initially concentrated in San Francisco and New York. Friendster networks grew rapidly through word of mouth and through email invitations from community members themselves. Originally intended as a dating service, this aspect quickly gave way to a playful—and often voyeuristic—exploration of the new territory of social relations possible in online communities.

Our thinking about digital communities is still arguably in the shadow of the "global village," the powerful metaphor that describes how new communication technologies empower personal relationships across vast geographic and cultural differences (McLuhan, 1962). Recent research, however, suggests a different social emphasis: Rather than initiating relations with strangers, instant messaging, email, and other digital communication tools are used primarily to maintain relationships with people in close physical and social proximity (Haythornthwaite, 2001; Licoppe & Smoreda, 2005). Friendster tried to combine these approaches by building a community site around a social networking architecture: in effect, it provided tools for scaling up social networks rooted in proximate social relations and—equally significantly—for representing this dynamic to the community in new ways. In this context, Friendster provided a unique window into the communities and network structure of the global village (Wellman, 1999). Within the service, participants model local social contexts and communities. Through the network structure, these are woven together on a broader scale. Although the

service models a (potentially) global network structure, single participants have only a limited view of this scale—the network representation is limited to four "degrees" of separation (friends of friends of friends of friends). On the one hand, this keeps the fun and challenge of social networking on Friendster manageable (four degrees exposes much more of our social environment than is normally possible); on the other, it motivates some to want to see the global picture.

Visibility has its cost; in order to make broader social networks visible, Friendster flattens those networks, collapsing relationship types and contexts into the ubiquitous "Friend." More problematically, Friendster does not provide ways of mapping or interpreting the contextual cues and social structural boundaries that help people manage their social worlds. Physical distance, to abstract from the obvious, is not just an obstacle to building social relations but is also the dimension in which different social contexts and norms are deployed. The distance between the office and the pub is not just a practical convenience but also a tool for interpreting and maintaining boundaries between connected social worlds. Because Friendster draws from everyday social networks, it incorporates these differences and boundaries while greatly diminishing people's abilities to manage them. This was hardly fatal to the Friendster phenomenon, but it helps explain many of the subsequent developments within the network. It illustrates an inverse relationship between the scalability and manageability of social networks—a *structure of participation* that marks these very early stages of social software development.

Not surprisingly, participants responded to the lack of differentiating texture and shared reference points in Friendster's flattened social networks by negotiating new social norms and rules of conduct, communicable through the existing features of the system. This articulation of identity and relationships was a new challenge for most participants, and was accompanied by uncertainty about how to formalize or broadcast their social judgments without rupturing trust or destroying relationships. Partially flattened social structures are a fact of everyday life (e.g., when friends and family and colleagues come together), but experiences with them are often uncomfortable, particularly when the collision of separate networks is unexpected. Digital worlds increase the likelihood and frequency of collapses and require participants to determine how to manage their own performance and the interactions between disparate groups.

Wading through new forms of individual and community interactions can be both terrifying and exhilarating. Although adults have become accustomed to ritualized ways of interacting, the foreign nature of social structure is a fundamental part of childhood. Children play in order to make meaning out of social cues and to understand the boundaries of social norms. Because Friendster requires participants to reassess social boundaries and limitations, it is not surprising that play became an essential aspect of participation, as users worked out social norms and reinserted valuable missing social cues. The early adoption of Friendster was riddled with playful interactions, most notably the proliferation of "Fakesters"—invented profiles used, among other things, to help signal group and cultural identification and allow people to play within the system.

Drawing on ethnographic data and personal observations, this chapter analyzes the growth of Friendster and the negotiation of social boundaries among early adopter populations. How did Friendster become a topic of conversation among disparate communities? What form did participation take and how did it evolve as people joined? How do people negotiate awkward social situations and collapsed social contexts? What is the role of play in the development of norms? How do people recalibrate social structure to accommodate the conditions and possibilities of online networks?

Friendster was not the first online tool to juxtapose and make visible global and proximate social contexts, but it was the first tool popular enough to test of the limits of the concept, in part by expressing emergent properties that changed the character of interactions on the network itself. This juxtaposition is at the root of many new forms of social software, from social bookmarking services like Del.icio.us to photo-sharing services like Flickr, both of which aggregate and connect networks of friends, family members, and acquaintances. While Friendster is now not nearly as popular as in its heyday, it continues to provide a benchmark for understanding the continuously fluid relationship between designed systems and community appropriation.[1]

methods

The flattened representations of social worlds characteristic of online communities can be difficult to study: Their limited frameworks both condense and obscure the complex social dynamics they map. I was introduced to Friendster in December 2002 and created an account in January 2003. I had close connections to the first three subcultures that made significant use of

Friendster: Burning Man art festival aficionados, Silicon Valley techies, and the urban queer communities. My residency in San Francisco and frequent pilgrimages to New York provided me with many opportunities to track this process of adoption; early adopters were primarily from these two urban regions. Throughout this period, I wrote about the evolution of Friendster on my blog. The popularity of the blog led to conversations with venture capitalists, press, active participants, and Friendster haters, providing another window onto the Friendster phenomenon. Readers sent me anecdotes and observations, answered questions I posed on the blog, and forwarded communications from other users and the service providers.

My data collection began as a personal project, as I was not affiliated with any institution. My ethnography took on a more structured style in June 2003, when Tribe.net hired me to analyze Friendster. I held six focus groups and interviewed or surveyed more than 200 users (either in person or via email/instant messaging). I tracked public blog and mailing list discussions and spent countless hours surfing the articulated networks and reading profiles. Because Friendster accounts were created in numerical order, I could detect which accounts were active or deleted. Although not all profiles were visible, my estimates indicated that I could view approximately 80% of active, connected users created before October 2003. Although this data collection had significant limitations, I was in an excellent position to observe the spread of the Friendster meme, in terms of its core subcultures, its viral growth, and the practices of its early adopters.

Although Friendster continued to grow after 2003, this chapter focuses on issues and events that took place during that first year. During 2003, Friendster went from an unknown startup to a subcultural phenomenon to one of Fox News's phrases of the year (D'Angelo, 2003). By the end of 2003, the technology was failing and disagreements between participants and the owners resulted in the expulsion of many users. By mid-2004, early adopters had mostly abandoned the service and a new generation of users had emerged among teenagers in Singapore, Malaysia, and the Philippines. This intriguing global migration falls outside the scope of this chapter and my data collection.

early adopter subcultures

Friendster launched in the fall of 2002 with only a word-of-mouth publicity strategy: Its developers told their friends, who told their friends, and so on. On June 4, 2003, the *Village Voice* ran the first major article on Friendster

(O'Shea, 2003). By then, Friendster had more than 300,000 users. By October 2003, more than 3.3 million Friendster accounts were registered. Where did the users come from, and how did they know about the service?

Silicon Valley information technology professionals belong to an unusually close-knit social network dating back to the early days of the tech industry (Saxenian, 1994). It is not surprising that Friendster found fertile ground there. In 2003, still recovering from the dot-com bust, Silicon Valley software entrepreneurs were beginning to see new possibilities in "social software." Investment flowed into wikis, blogs, and social networking tools. Friendster was not the first online social network site. SixDegrees.com released a similar product in 1997, but the incentives for participation were hazy, and the service failed to attract a self-sustaining community. When Ryze.com launched in early 2002, it tried to clarify the incentives question by dedicating itself to business networking. With more than 250,000 users, it has enjoyed modest success in hosting and connecting such networks. Friendster's founders also perceived the incentives problem and launched their dating service as a complement to Ryze. The wild success of Friendster outside these original parameters represented a change for online social networking, creating a mass public for these sites, engaging people in a variety of contexts. In the wake of Friendster, social network sites have become much more common and their features are integrated into many other kinds of services. In terms of size, Friendster has been surpassed by several similar services, including MySpace and Facebook. At the time of publication (2007), MySpace has more than 175 million accounts and, in November 2006, ComScore reported that MySpace passed Yahoo! as the leader in U.S. web traffic with 38.7 billion U.S. page views that month (Jesdanun, 2006). Facebook launched in 2004 as a niche site dedicated to college students; it has since expanded to welcome a much wider audience, but by 2005 it was used by 85% of students on the college campuses that it supported (Toomey, 2005).

Friendster encouraged users to post personal profiles and associate them with other profiles on the network, thereby creating a list of Friends associated with the member's profile (see Figure 8.1). Using Friendster was largely an experience of surfing these personal networks. Profiles contained the usual dating-related personal information: interests and tastes in music, film, and TV; age, sex, relationship status, and sexual preference; geographical and occupational information; photos and biographies. What differentiated Friendster profiles from other dating profiles (Fiore & Donath, 2004) was



8.1. Example Friendster profile. [NOTE: This profile has been altered for demonstration; elements have been deleted and layout altered.]

the inclusion of Friends and testimonials, features that constitute a social network site. Participants could invite outsiders to join via email, and the recipient would become part of the sender's network upon joining. Alternatively, participants could add Friends from within the network. When both parties consent to Friendship, their photos are included under the "Friends" section in each other's profiles. Friendster Friends were not always friends elsewhere; who people choose as Friends in the system varies tremendously (boyd, 2006). Additionally, participants could write testimonials about their Friends that would be displayed on their profile.

Within Friendster, participants surfed the networks looking for current and past friends and for other entertaining profiles. The dating architecture quickly proved flexible and expressive enough to support a wider range of activities than originally anticipated. Some used the service for dating while others used it as their primary email and messaging tool; still others used it for drug distribution and race-based harassment (boyd, 2004). The most consequential and—arguably—inventive direction of user innovation, however, was the exploration of new ways to signal group affiliations and boundaries through the profile system itself. This culminated in the proliferation of Fakesters—fake profiles that signaled not the individuals behind the profile but communities, cultural icons, or collective interests.

Although Friendster gained an initial foothold among residents of Silicon Valley, its explosive growth was closely tied to a second phase of adoption by technology-savvy Bay Area and New York subcultures. The capacity to model, visualize, and extend social networks proved very attractive for these groups. In particular, two subcultures—gay men and "Burners" (people identified with the annual Burning Man arts festival in the Nevada Desert[2])—were the most active in defining the early culture of Friendster. By February 2003, gay-identified Friendster users concentrated in New York and Burners in San Francisco (home of many of the festival's founders) dominated the service. This virtual geography mirrored prominent offline social networks connecting Silicon Valley and San Francisco, and San Francisco and New York. Recognition of this larger network geography, however, was diminished by the limited social overlap within these subcultures: Gay men often perceived Friendster as a new gay dating site, while Burners assumed it was a tool designed for them. Both groups were broadly ignorant of each others' presence, as well as of the Silicon Valley geeks on the service (although the geeks were typically aware of both Burners and gay men). Because access

passed only through those "in the know," Friendster initially acquired cachet as an underground cultural tool.

The spread of Friendster both reflects the broader cultural values of the participating social groups and reveals the structure of their networks. Prior to the extensive media coverage in 2004, knowledge of Friendster spread almost entirely through personal networks. Individuals invited friends who they felt would "fit in," simultaneously interpreting, defining, and reinforcing subcultural dominance of Friendster. Gay men, believing Friendster to be a gay dating service, tended to invite other gay men. Burners invited people with similar interests. As already indicated, technical reasons limited the visibility of social networks on Friendster to four degrees of separation,[3] meaning the horizon of any person's network was limited to friends of friends of friends of friends. While this limitation made it possible for participants to see most of the people that they knew, it also made the service appear more homogenous than it was. This limitation magnified perceptions that Friendster was a space for narrow communities of interest.

Most of Friendster's early adopters were educated urbanites in their 20s and 30s. After the Burners and gay men, the Friendster meme quickly spread to other identity-driven communities in urban regions, including ravers, goths, hipsters, and members of other taste subcultures. The apparent homogeneity started to break down. Although subcultures are often perceived as distinct, their social networks are frequently connected through shared late-night venues, music and clothing stores, and political activities. Many individuals bridge multiple scenes, resulting in labels like "graver" (goth + raver). Friendster made many of these interconnections visible and gay men started to see Burners and vice versa.

participatory performance

The flow of knowledge about Friendster affected not only who chose to participate, but also *how* they participated. The first act of a new participant is to create a profile and to connect it to others on the service. Most people join after being invited by a friend. Upon entering the service, newcomers visit their friends' profiles to see how they chose to present themselves. The profiles signal social norms within groups and newcomers generally follow suit in crafting their own profiles. In the case of Burners, these norms included the use of "Playa" names,[4] uploaded photos from Burning Man or related parties (which have their own style involving little clothing and lots of colorful

adornment), and the presentation of interests that resonate with the values of the Burner culture. Through this process of integration, Burner culture on Friendster is reinforced and reproduced. The process is dynamic, as described by one of my respondents:

> **"I change my profile if I see something on someone else's that I might have forgotten (oh yeah! I love that movie, too!) or if I get a sense from scanning others' profiles that mine is too detailed, not witty enough, leaves out parts of my personality I hadn't thought to cover, etc." —Alie**

The performance of identity relies on the active interpretation of social contexts. Familiarity with a context increases a person's ability to navigate it—to understand what is appropriate or advantageous within it—and thereby shapes choices about the persona one tries to present within it (boyd, 2002). Contexts are not static backgrounds, but constantly evolve through this process (Duranti & Goodwin, 1992). Digitally mediated performance is no different, but the novelty and narrower channel of interaction affect our capacity to interpret context. Without a long-standing history and set of material cues, people must collectively develop the norms and build the root contextual framework through their performance and interactions. Although every Friendster profile has the same layout, the freedom to select photos, self-descriptions, and other elements creates a performance space in which norms are established and interpreted. Early adopters had a relatively clean slate on which to make meaning and build context.

Although participants play a strong role in the development of cultural norms, Friendster is still a privately controlled environment. The company sets guidelines for acceptable practice, via both rules of conduct and architectural constraints. A ban on nudity in profiles is one such rule, although many participants push that boundary. Participants are further restricted from linking to their personal websites and they are expected to use real names and upload photos that depict them in natural settings, without digital alteration or copyrighted material. Friendster enforces its policies by removing infringing material. Tensions emerge when participants perceive themselves as the primary norm setters and the developers' actions as restrictions of presumed freedoms.[5] Despite these boundary issues, the service provided considerable latitude for experiments in enacting identity and could do little to constrain the interpretation of those performances (Donath & boyd, 2004).

Friendster's social networking tools support a powerful process of community formation around shared values and tastes. Social groups tend to converge collectively on a coherent presentation style and encourage, if not pressure, other participants to follow the collective norms (e.g., regarding photos). The domination of the early Friendster by a few distinct and relatively homogeneous subgroups simplified this process. As the network grew and diversified, and as the Friendster developers promulgated more rules about acceptable content, participants developed new ways of structuring and signaling collective identities.

In September 2003, I began receiving messages on Friendster asking for my "Suicide Girl" name and the location of my porn site. This puzzled me until I started visiting the profiles of self-identified Suicide Girls and began to appreciate the collective dimension of Friendster's "personal" performances. SuicideGirls.com is a for-pay porn site for "Pin-Up Punk Rock and Goth Girls" where individual Suicide Girls keep pornographic pictures, journals, and videos. There is an active community of women who identify with the brand, almost all of whom have profiles on Friendster. These profiles typically display their fellow "pin-up" girl friends and the flocks of older men who subscribe to their site. Looking for patterns, porn aficionados interpreted my performance as akin to that of Suicide Girls because my network contained fellow Burners, older businessmen, and a half-naked photo. When a friend and fellow social software analyst selected a random photo from Google and depicted himself as an "old, white balding guy from the Midwest," my profile became visibly similar to those of the Suicide Girls (see Figure 8.2). Because his photo was prominently displayed on my page as a Friend, his choice in photo dramatically affected my performance. On Friendster, impression management is an inescapably collective process.

Conventional understandings of how identity is performed often assume a high degree of individual agency: People *convey* impressions, and these are usually deliberate. Sociological accounts have generally emphasized the interpersonal context of such meaning. For Erving Goffman (1956), impression management was fundamentally a process involving the performer and the reader, although teams could also consciously work together to convey particular impressions. Friendster participants quickly encountered the limits of the latter process.

As the numbers of participants in Friendster grew, so too did the diversity of the social networks represented. A growing portion of partici-



8.2. Performing Suicide Girl: my picture and "old white balding guy."

pants found themselves simultaneously negotiating multiple social groups—social and professional circles, side interests, and so on. Because profiles presented a singular identity to the entire network, however, this diversification brought with it the potential for disruption of individuals' carefully managed everyday personas. Photos were the most common problem; those that signaled participation in one group were not always appropriate in another. The prominence of Friends on individual profiles meant, moreover, that the difficulty of accommodating one's profile to different audiences became a complicated and often irresolvable problem of controlling the performances of others—a negative network effect.

As Friendster grew, conflicting standards became a common problem. The border between professional and personal relations was the most frequent source of difficulty: "Cool" photos of social adventures clashed with generic headshots. Most often, participants chose to professionalize their profiles in the same way that early web developers did when the sites became more accessible to their colleagues. On Friendster, this significantly impacted the forms of sociability underlying the service.

Because Friendster flattened multiple local social contexts into a single performance space, it neither represented nor provided the means of managing the multifaceted performances that characterize most people's lives. Although social networks became visible in new ways, the new relational structure created social juxtapositions without context and created problematic social borders that people otherwise negotiated with relative ease. Teachers, for example, are required to separate their personal and political lives from their educational roles. Participating in Friendster under these professional conditions carried with it unexpected risks.

In June 2003, a young San Francisco teacher joined Friendster to connect with her Burning Man friends. Her profile was uncontroversial—diverse personal interests matched with a photo taken while hiking. In September some of her 16-year-old students approached her with two questions: Why do you do drugs, and why are you friends with pedophiles? Although her underage students could not legally join Friendster, in practice this was no impediment: They joined and found her profile. The drug reference came not from her profile but from those of her Friends, some of whom had signaled drug use (and attendance at Burning Man, which for the students amounted to the same thing). Friends also brought her the pedophilia connection—in this case via the profile of a male Friend who, for his part, had included an in-joke involving a self-portrait in a Catholic schoolgirl outfit and testimonials about his love of young girls. The students were not in on this joke. The teacher faced a predicament—if she deleted her account or her links to Friends, she signaled guilt to her students. Asking her Friends to alter their profiles to suit her needs seemed complicated and burdensome, and unlikely, in any event, to erase the earlier association. She resolved to stop using Friendster, hoping that the controversy would simply go away.

articulated participation

Transparency—of social networks, of personal histories, of judgments of others—is a powerful idea that drove much of the early exploration of digital networking. Digital systems raised the potential not simply to expand access to information but also to unfailingly record the history of that process—a point that underlies Geoffrey C. Bowker's argument about databases (Chapter 2, this volume). This had an appealing liberatory dimension in that it seemed possible to disintermediate information from its institutional managers, placing it directly in the hands of individuals. One of the basic lessons of social informatics and social system design in the past decade is that such transparency makes a poor end in itself. It can be pursued or enabled in ways that prove destructive of the social fabric that underlies functional sociotechnical systems. Many social processes depend on forms of selective disclosure, strategic ambiguity, and/or mediation within networks. Maintaining the privacy of sensitive information is a common goal but not the only one in such contexts. Lack of clarity is often a key to agreement. In other cases intermediaries play key roles in filtering or translating information between

groups with different perspectives or conceptual frameworks (e.g., technical and clerical staff within an office).

Although transparency of information poses an interesting challenge, where the information comes from is also a problem. As Jenny Sundén (2003) noted, digital embodiment requires writing yourself into being. On Friendster this means an explicit articulation of who you are and how you relate to others, using the predefined mechanisms for expression. Through a series of forms, profiles must be crafted to express some aspect of identity and relationships must be explicitly acknowledged in order to exist within the system. Unlike everyday embodiment, there is no digital corporeality without articulation. One cannot simply "be" online; one must make one's presence visible through explicit and structured actions.

It is hardly surprising that many participants find social interactions on Friendster formulaic. The social structure is defined by a narrow set of rules that do little to map the complexities and nuances of relationships in other contexts. Formula-driven social worlds require everyone to engage with each other through a severely diminished mediator—what I have elsewhere called autistic social software, as a metaphor to signal the structured formula that autistic individuals learn to negotiate social contexts (boyd, 2005). This is not an appealing prospect for most people and some joked that the "Are you my friend? Yes or no?" question that most social networking services asked resembled the kinds of questions frequently used by Dustin Hoffman's character in *Rainman*. Participants' language evolved to reflect this perceived deficiency (e.g., "She's my Friendster but not my friend!").

To an American sociologist, the term *friend* signals a strong tie relation in distinction to weak tie relations or *acquaintances*. In everyday vernacular, *friend* does not represent the same tie strength across all people and cultures. In more gregarious societies, the term often represents a variety of different relations and tends to confer respect more than tie strength. In American youth culture, there are hierarchies of friends—friends, best friends, bestest friends. These terms signal social judgments, or personal feelings about the value of the relationship. While these labels can signal the significance of the connection, an individual's internal model may not reflect what is said out loud. Relationships rarely have clean boundaries, yet social etiquette often requires us to not make our true feelings known publicly. Plausible deniability allows individuals to "save face," rather than admit to differences in social judgment. For example, when someone inquires about why they were

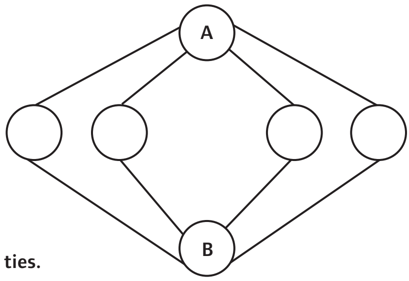
not included on a guest list, an appropriate response would be "Oh my, I'm so sorry—I totally forgot!," rather than "I didn't want you there." Expressing social judgments publicly is akin to airing dirty laundry and it is often socially inappropriate to do so.

Friend requests on Friendster require people to make social judgments about inclusion and exclusion and—more to the point—to reveal those decisions. Approval means that the new person will be listed on one's profile, available for everyone to see. Denial, in contrast, implies no correspondingly public humiliation, or even direct acknowledgment to the petitioner. Yet, because it is impossible to log in without being reminded of pending requests, the petitioner can assume that they were denied, should the recent login date be updated. The lack of strategically ambiguous excuses for denying a request means that refusal has a potentially high social cost. Many participants feel pressure to accept connections with people they do not regard as friends simply so that they do not have to face the challenges of rejection.

The perfectly reasonable original intent of the Friend structure—to expand the circle of known relations who could help in matchmaking—did not survive this disambiguation of social networks. Yet, the process of articulating Friendsters condenses all the ambiguities of the embedded relationships and expresses what is traditionally socially uncouth.

Although the process of articulation presents an issue of social embarrassment, there are further social costs to having the information visible. Although people are providing the system with meaningful data, they may or may not be prepared for how that information is interpreted. Consider the case of Cobot, a robot that collected social data in LambdaMOO (Isbell, Kearns, Korman, Singh, & Stone, 2000). When the system began sharing what Cobot learned about who spent the most time talking to whom, the social structure of the system collapsed. Even though the quantitative information said nothing about the quality of relationships, having that information available made people doubt their relationships with others on the system. Trust collapsed, and the culture of the community was undermined by transparency. What systems know and how they are interpreted are often unrelated. On Friendster, participants are often unprepared for what their relationships may signal to readers or to the system.

Social network analysis depends on knowing the strength of individual relationships and on having a consistent representation for that strength



8.3. Common ties.

within the system. On Friendster, tie strength is made ambiguous by the label "Friend"; Inconsistency in marking relationships is rampant. Consider the network scenario that motivates Friendster—connecting people who share common ties. Figure 8.3 describes a situation when two individuals (A and B) are not directly connected, but share ties to numerous third parties. Feld (1981) argued, plausibly enough, that individuals who are connected this way have a higher probability of having traits or qualities in common, particularly if the third parties do not know each other. The Friendster creators thought that this made for an ideal dating situation: If A and B meet, they will share much in common. In practice, however, Friendster social networks guarantee no such thing. Connections on Friendster do not signal strong relationship ties; people often connect to others whom they simply recognize, a connection that would never appear in a sociological network. Moreover, numerous common ties in Friendster tend to means one thing: exes. If A and B share a lot of friends but do not connect to one another, this is most likely due to a severed personal connection, not a social opportunity. This rather basic social fact cannot be rendered. The Friendster network is not modeling everyday social networks, but constituting its own, with distinctive rules and patterns of interaction.

Publicly performed social networks are fundamentally different than what sociologists study because they represent more than tie strength. Impression management is encoded into articulated networks. The variable ways in which people interpret the term *friend* play a critical role, as does the cost of signaling the value of a relationship. Friendster's developers viewed the inconsistencies in participants' practices as malicious acts meant to foil the service's globally defined norms, failing to recognize that people were grappling with the norms present in a flattened world and weighing the costs and benefits of exposing their social judgments of others.

Individual clusters within the network set the norms on Friendster. One's choice in profiles is affected by the choices of those around one, setting the tone both for performance and interpretation. As people seek to make meaning from the profiles and determine what is appropriate to do in cases of socially awkward situations, they rely on the perceived norms built up from those around them. Some individuals complained about people having too many Friends while others felt as though collecting Friends was the primary purpose of the service. When these two norms collided, terms like "Friendster slut" and "Friendster whore" emerged. In turn, some participants chose to celebrate their "slut" and "whore" status, viewing promiscuity as something to reclaim. Ryan Schultz, in a blog called Friendster Slut (http://friendsterslut.blogspot.com) tracked his efforts to connect to as many people as possible in order to see as much of the network as possible. Testing the limits of Friendster's architecture, Schultz made social networking a game devoid of everyday referents and motivations beyond that of manipulating the network structure itself. The norms Schultz operated under came from the Fakester community, although he engaged in collecting people from his representative profile.

fakin' it: the rise of fakesters

Because participants have to write themselves into being on Friendster, there is no necessary correspondence with the embodied person. From the earliest days, participants took advantage of the flexibility of the system to craft "Fakesters," or nonbiographical profiles. Fakesters were created for famous people, fictional characters, objects, places and locations, identity markers, concepts, animals, and communities. Angelina Jolie was there, as were Homer Simpson, Giant Squid, New Jersey, FemSex, Pure Evil, Rex, and Space Cowboys. People connected to Fakesters as a way of enriching their own performances and in order to signal interests or tastes to others. Many Fakesters began as practical endeavors to connect groups of people; alumni networks were constituted through Fakesters representing universities, and Burning Man was crafted to connect Burners.

Fakesters were a way of "hacking" the system to introduce missing social texture. These purposes were not limited to group networking: The vast majority of Fakesters were exercises in creative and usually playful expression. They structured social activities, not just social groups, such as treasure hunts for the most interesting or creative Fakester. They introduced a public

art form within Friendster, creating a culture *on* Friendster to complement the site's mapping of subcultures.

On a public mailing list dedicated to Fakesters, users explained their motivations:

"Bored at work one day, I found some beautiful pictures of steaks and other raw meat, thus was Meat born. It was sad to see it [deleted]. For once I had created something people took joy in, if just for a few minutes." —"Meat," September 9, 2003

"After a few weeks on Friendster, all of the profiles began to look alike, except the Fakesters. . . . Fakester profiles clearly gave more scope for creativity and expression, and, were, in fact, MORE revealing than otherwise." —"Quotester," September 10, 2003

"It seemed like the natural thing to do. All the cool [profiles] were fake. . . . Then I found out [Fakesters] were getting killed and I started making more and more. Bullwinkle, Slush Puppie, Stonehenge, Hippie Jesus, Zakeel, Mr. Gobbles, I can hardly remember them all." —Hilary, September 9, 2003

"Well, I thought Friendster was pretty boring for the first few weeks. Then I came across Whitney Houston. It wasn't Whitney that got me hooked on Fakesters, but a testimonial from Little Jon-Bennet [sic] Ramsey. Jon-Bennet said 'Whitney wrote "It's not right, but it's OK" about my tragic murder.' I was laughing so hard when I saw all of the testimonials for JB. She was so adorable. It was great to see the comments from people leaving messages about her evil mom. Anyway, I HAD to have my own little Fakester, and since I think Patsy Stone is such a fabulous rebel, she was the perfect choice." —"Patsy Stone," September 10, 2003

Consistently, creators of Fakesters referenced their desire to have fun with the Friendster process and the positive feedback they received. In addition to the most active, prolific, and creative Fakesters, there were also users who would construct profiles that were a mix of their interests connected to a fake name and a fake photo. The goal of these profiles had less to do with creativity and more to do with remaining anonymous so as to limit the conflation of disparate social groups. These individuals would only link to a fraction of the people that they knew on Friendster. For example, a young professor chose this route so that he could connect to his friends and play with the system without having to connect his students to his friends.

Fakesters also served a structural role in Friendster. Because participants could only see four "degrees" of separation from their profiles, connecting to popular Fakesters tended to expand the visible network. Without





8.4. Most popular Fakesters: Burning Man and Ali G.

the complications of managing multiple social worlds, Fakesters happily linked to anyone; popular Fakesters collected thousands of Friends and were the most active Friendster "sluts." In the original implementation, participants would see a list of the most popular people in their network on their homepage. Since popularity was based on the number of Friends, Fakesters collected Friends rabidly in order to be listed as most popular. Although the service eliminated this feature early on, two Fakesters dominated the popularity chart immediately and for the duration of the feature—Burning Man and Ali G (the gangsta persona of British comedian Sacha Baron Cohen; see Figure 8.4). These two reflected the cultural interests of groups of early adopters. For some participants, Fakesters altered the norms on Friendster, providing them with an excuse to collect Friends, play with their profile, and take the service less seriously:

"It's like high school, only fun. It's like a cult, except you can leave. It's like human trading-cards." —Stacie, August 16, 2003

Although most participants loved the playful aspect of Fakesters, it further complicated the network structure and created an appearance of unreliability, which irritated both the company and individuals intent on using Friendster for serious networking. Friendster's servers were not equipped to handle the exponential growth. Some participants were spending 12 or more hours on the service per day, sending thousands of internal messages. Active participants would update their profiles and change their photos multiple times per day. Because of this and the expanding size of Friend networks, the database crumbled. By early fall 2003, Friendster was unbearably slow and regularly down, prompting anger from participants. Because of earlier efforts to regulate Friendster community norms, the service creators were widely



8.5. Fakester Revolution imagery.

mistrusted; many participants felt they were being punished for their fun. Paranoia emerged in the bulletin boards as word spread that individuals were being targeted for limited access; others argued that the problems were the precursor to a tiered fee structure.

When Friendster eliminated the “most popular” feature in May 2003, they also deleted both Burning Man and Ali G, each of whom had more than 10,000 friends. This was the start of a Whack-A-Mole–style purge of Fakesters, in which Fakesters and Friendster competed for dominance. Fakester farms were created and Fakester owners would duplicate their Fakesters for reinsertion. In late June, a group of Fakesters gathered on the Friendster bulletin board (and later in a Yahoo Group) to begin “the Fakester Revolution” that would end “the Fakester Genocide” (see Figure 8.5). They crafted “The Fakester Manifesto” (Batty, 2003) “in defense of our right to exist in the form we choose or assume” which included three key sections:

1. **Identity is Provisional**
2. **All Character is Archetypal, Thus Public**
3. **Copyright is Irrelevant in the Digital Age**

Roy Batty, a leading instigator in the revolution and the author of the manifesto, helped organize and publicize the Fakesters. In mid-August, both *Salon* and *SFWeekly* published extensive write-ups of the Fakester antics entitled “Faking Out Friendster” and “Attack of the Smartasses” (Mieszkowski, 2003; Anderson, 2003). The war between the Fakesters and Friendster



8.6. Mer's self-portrait.

was discussed on mailing lists, via the bulletin boards on Friendster, and over the watercooler. Needless to say, this incensed the company even more. As Friendster increased their crackdown, many of the practical Fakesters disappeared, even though few users objected to these Fakesters and most found them valuable. Regular participants who used nonrealistic photos (like "Mer" in Figure 8.6) were also deleted. Friendster capped the number of linked Friends as a stopgap measure against the Fakesters, resulting in more frustration and hysterical posts. One bulletin board message was titled "Friendster Won't Let Gay Pride Make New Friends!" (message from "Gay Pride," August 16, 2003).

In retaliation, Fakesters created Fraudsters, who impersonated other people on the service. Fraudsters were meant to confuse both the Friendster service and serious users. A Fraudster impersonating the site's creator, Jonathan Abrams, contacted many of his friends and other users on the service with fraudulent messages. Pretendster.com was created to insert another type of fake profile into Friendster. Pretendsters combined random photos from the Web and random profile data. They were not fraudulent portrayals of any particular person, but automated Fakesters that mimicked real profiles.

Around this time, Roy Batty organized a handful of Fakesters in protest outside a San Francisco venue where Jonathan Abrams was speaking. Batty often wrote polemic addresses for the Fakesters. In a message entitled "Hang Tough Campers," he explained the movement's goals:

"As I mentioned in my posting, a lot of the fun in what we do comes from the fact that we are not following Friendster's rules. If we're allowed, it undermines our status as outsiders. This 'revolution' has polarized people, and you can't give us that kind of thrill (the sheer amount of press coverage alone justifies continuing our

battle—and there are also important points we're making about artistic and free expression). Our argument with Friendster gives us a focus for our passions. And no other similar site is as trafficked, so what we do, since many of us crave attention, is more visible there than anywhere else. . . . Geekspeak translation: The Rebel Alliance has no purpose without Darth Vader to fight." —Roy Batty, September 11, 2003

The rhetoric of the most outspoken Fakesters activated the posture of resistance available in many Friendster subcultures, while simultaneously alienating the more mainstream users who did not recognize or appreciate the elements of parody in the Fakesters' activities. The Fakesters played on or parodied aspects of traditional subcultures, from deviant behavior, to active resistance, to the rhetoric of oppression. They used alternative channels for social networking that strengthened their collective presence outside the service and that made Friendster a site of collective action, rather than a medium of communication. The Fakesters' tone was appreciated by users who identified with being marginalized; their attitude was more upsetting to those invested in maintaining the original hegemonic purposes of the system.

Although Fakesters had taken on a collective impression of resistance, their primary political stance concerned authenticity. In discussing Fakesters, Batty was quick to point out that there's no such thing as an authentic performance on Friendster—"*None* of this is real." Through the act of articulation and writing oneself into being, all participants are engaged in performance intended to be interpreted and convey particular impressions. While some people believed that "truth" could be perceived through photorealistic imagery and a list of tastes that reflected one's collections, the Fakesters were invested in using more impressionistic strokes to paint their portraits. If we acknowledge that all profiles are performative, permitting users to give off a particular view of themselves, why should we judge Fakesters as more or less authentic than awkwardly performed profiles?

While the Fakester Revolution's antics were fun to watch, they lacked long-term momentum. Although the heavily publicized period of Fakesters ended in the fall of 2003, Fakesters never completely disappeared; there are still thousands on the service. When Friendster became popular in Asia, there was an additional explosion of Fakesters and Fraudsters. Yet for early adopters, the elimination of the initial Fakesters was the end of a period of freedom when the participants defined the context of their sociability.

Although Friendster initially rejoiced when the Fakesters and freak communities departed, their departure prompted a much larger user

abandonment of the service. On June 24, 2004, Friendster began recruiting Burners to return. Later that year they introduced affiliation markers in profiles and created sponsored Fakesters for advertising companies. In 2005 they introduced group identification and numerous other features to support dating. Some early adopters even returned to participate on Friendster in the manner intended by the designers, but the majority log in only rarely.

conclusion

The performance of social relations is not equivalent to the relations themselves, or even to an individual's mental model of them. The proposition that drove Friendster was that the articulation of relations through the system would make everyday social structures more visible; in turn, this would help people negotiate those structures more effectively, or at least efficiently. As Lessig (2000) and others have made clear, software code is a form of social architecture. By cementing a model of social relations into the Friendster architecture, the service was not simply representing everyday relations, but designing an entirely new social structure in which interactions could occur. Participants found that the available structure for social networking introduced new issues in managing and negotiating social relations that affected the underlying relations themselves—and that fed back into the system.

In order to make social relations more visible, Friendster flattened complex social structures. The abolition of distance—the classic Internet virtue—rendered many social distinctions invisible; the impact of Friends' performances on individual profiles undermined the individual's control over social performances; and the binary social network structure—Friend/not-Friend—erased a broad field of relationship nuances. Absent these strong orienting features, participants negotiated new norms and reintroduced new forms of social complexity. They developed new strategies for signaling affiliation while maintaining boundaries—producing or linking to Fakesters, rather than to potentially compromising Friends. This allowed for a certain recovery of control over identity performances, but at the cost of the larger consensus about the norms and purposes of the system.

The persistent, searchable, and semipublic nature of relationship articulations on Friendster had a further consequence: Unlike the ephemeral social contexts in which relationships can be signaled and negotiated (e.g., at parties), Friendster required participants to really consider the implications of their associations. Because of this, visible connections were not simply

an expression of an individual's mental model of exterior relations, but an explicit performance of a social network intended for consumption by others, whether visible or invisible during the performance creation.

Although the shifts in social structure became apparent through participation, the desire to participate had both a voyeuristic and performative quality. Friendster created a stage for digital flâneurs—a place to see and be seen. Yet unlike the physical equivalent, people had no way of knowing when they were being seen and who was seeing them.[6]

Friendster built on the widespread appeal of representing and extending personal networks, yet never quite resolved the social consequences of that extension. For a while the playful exploration of social structure and identity performance known to children emerged as a way of smoothing that tension. But just as children's antics exhaust their parents, the exploratory and playful games of some participants irritated Friendster's creators and many of the more serious participants. By waging war against play, Friendster took a long time to learn from those antics and help participants resolve the structural issues that play exposed.

Millions of people worldwide are now connected through networked digital infrastructures in forms that grow increasingly sophisticated and contextually rich. The notion of the global village remains powerful, but individual sociability will never operate on a global scale. Large social networks will always be mediated by and constructed through smaller communities and individual relationships. Among other things, Friendster demonstrates the inverse relationship between the scale of social networks and the quality of the relations within them—a relationship rooted in the limits of human time and attention. It also demonstrates that digital networks will never merely map the social, but inevitably develop their own dynamics through which they *become* the social. The interaction of people with information systems is recurrently marked by play and experimentation, as people test the limits of their settings and manage the consequences of unexpected interactions and altered contexts. Digital social structures disrupt the boundaries that define social communities, but the reassessment of context and performance that accompanies this is endlessly generative.

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notes

1 In this context, my chapter and Shay David's (Chapter 11, in this volume) investigation of "online knowledge communities" share some core concerns and take opposite tacks on others. Both pieces are concerned with the implications of the thin social texture of online communities—mine in a context where the thick field of offline social distinctions is the default referent; David's in a context where that distance is used to erase a priori social distinctions, such as expert hierarchies. David's concern with how to establish forms of legitimacy over knowledge production within online systems is not germane to Friendster, which is more invested in supporting sociability than information transfer.

2 Information about Burning Man is available at http://www.burningman.com.

3 The term *degrees* stems from the play *Six Degrees of Separation* and refers to what network analysts call a path length between nodes. Four degrees in Friendster terminology is thus equal to a path linking four nodes (or, in this case, persons). Although it is not a term proper to network analysis, I use it following the norm established by the participants themselves.

4 Playa names are the nicknames that Burning Man attendees choose to adopt for the week in the desert in lieu of their given names. Playa names help maintain the fantasy that Burning Man is an alternate reality.

5 The lack of a fee structure and the empowerment of certain kinds of actions (e.g., freedom of association) underwrite a persistent and—in online environments—common uncertainty about the "public" character of the service, and the status of individual rights in relation to it (see, e.g., Nideffer, Chapter 12, this volume).

6 In September 2005, Friendster implemented an optional "Who's Viewed Me" feature. Users were able to access who visited their page provided that they allowed the system to inform other users of their profile visits. While this feature is available in other dating sites, many Friendster users felt that it was creepy and turned it off.

9 Notes on Contagious Media

Jonah Peretti

1
Global capitalism has produced hundreds of millions of bored office workers who sit in front of computers forwarding emails and surfing the Web. These alienated white-collar professionals spend half their day sharing media with their friends, inadvertently creating the Bored at Work Network (BWN).

2
A by-product of alienated labor, the BWN has become the largest alternative to the corporate media. Activists, artists, and hackers can reach millions of people through the BWN, successfully distributing media that governments would deem illegal and corporate outlets would censor.

3
The type of media distributed by the BWN is "contagious media." Contagious media starts small but spreads virally to a large audience because people share it with their friends. Humorous emails, joke websites, web-based games, silly video clips, and political calls to action are often characterized by this sort of viral propagation.

4
Blogs, message boards, and email lists accelerate the spread of contagious media. These communication tools are usually maintained as a labor of love. For workers within global capitalism, procrastination and boredom inspire the last surviving forms of unalienated labor.

5
Contagious media is best understood from a social perspective. It does not matter if it is an email, a movie, or a game. What matters is how it diffuses virally through human-powered networks.

6
Contagious media is the kind of media you immediately want to share with all your friends. This requires that you take pleasure in consuming the media but also pleasure in the social process of passing it on.

7

People only remember media that has a social context—we forget about TV shows, websites, and movies unless they inspire conversation, provoke debate, or move us to tell a friend. Contagious media is inherently social, since it is distributed through a network of friends, and this transmission often provokes dialogue. This means that contagious media has a bigger cognitive impact than the majority of broadcast media.

8

For the artist, a work can be celebrated even if the only people who like it are a small group of curators and collectors. Furthermore, an artist can be satisfied with a creation for its own sake, even if nobody else appreciates its brilliance. For the contagious media designer, all that matters is how other people see the work. If people don't share the work with their friends, it is a failure regardless of the opinion of the creator, critics, or other elites.

9

Contagious media is defined by its audience, not its author. The audience decides if a particular project is art, activism, or entertainment. The audience decides if the project reaches 10 people or 10 million people. The audience is the network and the critic.

10

Contagious media is like "tactical media," without the burden of underground credibility. By definition, the moment media becomes contagious it ceases to be underground.

11

"Net art" only makes sense when networks are novel and unfamiliar. Contagious media only makes sense when networks are pervasive and unremarkable.

12

If a "meme" is a self-replicating idea (Dawkins, 1990), then contagious media is a meme in the flesh. It is an idea embodied as media that people can share.

13

To be successful, contagious media projects must be explainable in one sentence or less: "A phone line for rejecting unwanted suitors"; "A site to rate people based on if they are hot or not"; "A request for a pair of Nike shoes customized with the word 'sweatshop'"; "A technique to make bonsai kittens"; "The homepage of two white people bragging about how black people love them." If you need more than a sentence to describe a project, you should probably not bother.

14

Contagious media is a form of pop conceptual art, where "the idea is the machine that makes the art" (LeWitt, 1967) *and* the idea is interesting to ordinary people.

15

The field of media studies analyzes how various media forms communicate differently: film, TV, print, multimedia, and so on. The study of contagious media ignores format and looks exclusively at how media moves through social networks. It does not matter if the media in question is an email forward, a website, a movie, a TV show, or a text message. All that matters is how it is spreading and the social networks that are facilitating the spread.

16

The medium only matters insofar as it limits or enables diffusion. Email forwards and viral text messages can spread with no cost to the original author because they use other people's servers and networks to propagate. Websites are inexpensive, but the host must bear the cost of bandwidth. Phone tree systems are prohibitively expensive for most artists and activists doing contagious projects. For contagious media, format is not judged on its sensory qualities, but rather its scalability.

17

A contagious media project should represent the simplest form of an idea. Fancy design, extra content, or extraneous features make media less contagious. Anything extra constitutes a "payload" that the contagious media needs to drag along as it spreads. The bigger the payload, the more slowly the entire project spreads.

18
Contagious media needs to be portable and infinitely reproducible. The easier it is to share and duplicate, the greater the potential that an inherently contagious idea will see the light of day.

19
In the early days of the Internet bubble, people thought the Web would replace the mass media. After the crash, people thought that the Web was useless. In fact, mass media and contagious media have a symbiotic relationship. Every successful contagious media project gets coverage by the mass media, and every major mass media story provides the basis for the parody, satire, and critique by contagious media. Contagious media can have an impact by infecting the mass media, but it is also a parasite on the mass media.

20
Many contagious media projects are created by accident.

21
It is very difficult to predict whether something will become contagious.

22
Like other collective nouns, "contagious media" may take a singular or plural verb, depending on the intended meaning.

23
This document is about contagious media, but is not intended to be an example of contagious media.

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10 Picturing the Public

Warren Sack

In this volume we have seen repeatedly how network technologies enable not only new forms of social and cultural interaction but also new representations of the collectivities and geographies in which those interactions take place. The Internet, especially, has been a flexible medium in which new technologies of representation can emerge, acquire power, and at the limit become "metonymous" with the world they represent—parts taken for the whole. This relatively open vista has created many new opportunities for technologies of representation to show the frequently obscured side of their function: that of enabling and ultimately transforming their objects.

The process is not new: Our basic concepts of association are rooted in different technologies of representation. These concepts privilege different valences of association—face-to-face connections, the relationship to a state or other authority, degrees of separation among a group of peers. The original meaning of the word "social" was coextensive with all types of association. But now, "we tend to limit the social to humans and modern societies, forgetting that the domain of the social is much more extensive than that" (Latour, 2005, p. 6).

This book offers ample evidence of the currency and power of "networks" as a way of thinking about forms of association. My goal in this chapter is to reinsert networks into a longer history of the linked metaphors and technologies that shape our understanding of the "public" and our agency within it, beginning with the early 20th-century debate between Walter Lippmann (1922) and John Dewey (1927) about the constitution of the public and ending with Noortje Marres's description of an "object-oriented public" (Marres, 2005), a critique of the limitations of the network metaphor and a proposal about how they can be overcome. In sketching this larger arc, I hope to illustrate the contingency of the descriptive power of the network especially in our discussions of electronically mediated association. Like older conceptions of association and assembly, it can be displaced as other tropes and technologies provide new leverage on forms of collective action.

In 1922 the journalist and political advisor Walter Lippmann published the now-classic text *Public Opinion,* in which he sought to define public life and the distinctly articulated publics that compose it. In the first chapter, "The World Outside and the Pictures in Our Heads," Lippmann advances the idea that public opinion consists of a union of the set of "pictures" in the minds of individuals. This "big picture," he argues, is the public's opinion about a given issue or event. In turn, "Public Opinion," writ large, is the sum of these

collectively held representations carried into action. It is the manifestation of public life:

Those features of the world outside which have to do with the behavior of other human beings, in so far as that behavior crosses ours, is dependent upon us, or is interesting to us, we call roughly public affairs. The pictures inside the heads of these human beings, the pictures of themselves, of others, of their needs, purposes, and relationship, are their public opinions. Those pictures which are acted upon by groups of people, or by individuals acting in the name of groups, are Public Opinion with capital letters. (Lippmann, 1922, p. 29)

Seen from 2007, one of the striking features of Lippmann's book is its reliance on a narrative analysis of this process, articulated with the techniques of storytelling rather than through statistics and questionnaires. Public Opinion may have been the manifestation of public life, but this object had no technology of representation that distinguished it from other theories and descriptions of public life. Although it proved influential on the emerging field of political science, it vied with other discursive accounts. This approach held sway well into the 1940s: The first volume of the journal *Public Opinion Quarterly,* published in 1937, retains much of Lippmann's discursive tone.

The transformation of public opinion into the object of statistical social science we know today—a science of polling and surveys—owes much to the work of midcentury scholars of media and communication like Paul Lazarsfeld, Harold Lasswell, Kurt Lewin, and Carl Hovland. All were central figures in the postwar development of statistical methodologies in American social science. The success of their project is visible in contemporary volumes of *Public Opinion Quarterly,* which are dominated by numbers, graphs, and mathematical formulas.

This hegemonic history of "administrative" media research is sufficiently well known that I will not rehearse it here (Lazarsfeld, 1941), but I do want to reflect on the meaning of this shift in the dominant technology for representing public opinion. With empirical measures and statistical techniques, public opinion became measurable and deployable in ways that allowed it to achieve legitimacy comparable to other technologies of representation of the public, such as voting. The new technology appropriated, empowered, and ultimately transformed the metaphor.

The science of public opinion provided a new answer to an old problem. Since the 18th century, social theory has struggled with a twofold problem of grounding authority: first, that of specifying a popular (and later national) will

that could legitimate authority; and second, the question of what "technology," in a broad sense, could represent that will. For Rousseau (2002), this technology was a special person—the legislator—who could divine the general will. For later German romantics, national languages became the vehicles of representation, with literature its operative technological form. For American constitutionalists, who integrated Locke's view of society's fall from original unity into conflicting interests, voting and political representation were the technologies through which differences within the larger public could be formally expressed and overcome.

Social science and philosophy have generated a vast number of other metaphorical descriptions of the public, rooted in different and often scientific perspectives on systematicity and relation. These are technologies in the broad sense that they enable different kinds of questions to be asked. An account of these would include the public as:

- **A PHYSICAL SYSTEM OR MASS. This metaphor underwrites work in mass communications and allows one to ask questions like "What is the impact of a given message on an audience?" *Mass* communications research arguably starts with Harold Lasswell's work on propaganda in World War I (Lasswell, 1927).**
- **A THERMODYNAMIC SYSTEM. In the 1940s Robert Merton and Paul Lazarsfeld advanced a program of research in which social structures were seen to be stable or unstable, in equilibrium or disequilibrium, according to group dynamics and the media messages that influence the members of a group. The metaphor of the public as a thermodynamic system engenders questions about the production and breakdown of social order. Thermodynamics, equilibrium, and entropy as tropes all become even more influential with the introduction of information theory (Shannon & Weaver, 1949).**
- **AN ECOLOGY. Earlier in the century Robert Ezra Park and E.W. Burgess (1921) founded a discipline they called "human ecology" to explain how relationships between individuals are governed by a struggle for territory that results in symbiotic relations of unplanned competitive cooperation.**
- **AN ORGANISM. A metaphor articulated by Herbert Spencer (1883–1890) in the middle of the 19th century, with descendents in the work of Marshall McLuhan (1994), who wrote of railways and telephone lines as the nervous system and/or vascular system of society. McLuhan allowed one to see how the public might become a radically different animal with the introduction of new media technologies.**
- **A NETWORK. In his review of contemporary French social science, François Dosse describes how social bonds and the weaving together of subjects and objects is**

currently conceptualized as a set of "sociotechnical networks" (Dosse, 1998, p. 96). Many French social scientists and philosophers have employed this metaphor (e.g., Bruno Latour, Gilles Deleuze, Felix Guarttari). In North American social science, quantitatively oriented sociologists of social network theory (e.g., Harrison White, Stanley Wasserman, Barry Wellman) work with an analogous vocabulary.

Other metaphors in circulation include the public as (ir)rational individual, public as information processor, public as market, public as evolving species, and so forth (see Mattelart & Mattelart, 1998). Our idea of the public is shaped by different configurations of these metaphors, which have varying degrees of currency in contemporary discourse (even if some have fallen out of favor within the social sciences). They remain relatively weak metaphors, however, until they couple with technologies of representation that can extend their reach.

The statistical revolution was the prelude to more sophisticated, computer-mediated forms of modeling and visualization of publics and public opinion. As Paul Edwards (1996) and others have argued, authority over many issues of general public concern (e.g., the state of the environment) has migrated from exclusively human hands into myriad meaning-making technologies—including, especially, information technologies. It is false nostalgia to reject this process. To claim that the will or opinion of the public can be felt in an unmediated, direct fashion is a rhetorical trick—although, for historical reasons, a very common and powerful one. The difficult question for students of media today is, therefore, not "How can public opinion be registered without technological mediation?" but rather, "How can new technologies of representation call into being more democratic publics with richer measures, modes of visualization, and structures of participation?" These technological imperatives can be understood as an effort to design what the philosopher Michel Foucault has called *technologies of the self* (Martin et al., 1988), that is, means for groups to reflect on their discussions, collectively authored "statements," and possible (dis)agreements (i.e., as pictures of public opinion).

According to the *Oxford English Dictionary,* the word "network" is very old. It was employed in the 16th-century translation of the Bible to represent the weaving together of sets of material strands (metal, fabric, leather, etc.). The use of the term as a synonym for a set of interrelated people, by contrast, is a recent invention. The verb "to network," meaning to introduce and be introduced to other people outside of one's immediate social circle, made its first appearance in the 1970s after the deployment of ARPAnet, the precursor to the Internet.

Within social science, networks are arguably an analytical discovery emerging in the late 19th-century work of Gabriel Tarde (see Latour, 2001), or, alternatively, of the 1930s social network research of Jacob Levy Moreno (1953). Regardless of the chosen date of origin, it does not require a historian of social science to note that structural analysis of social networks was largely invisible before the seminal work of Stanley Milgram (1967) and others in the 1960s. As the Internet developed into a highly visible instantiation of the concept, networks become both research objects in themselves and the objects of a new set of research methodologies (network analysis; e.g., Barabási, 2002).

It seems probable that the metaphor of the *public as a network* would not have gone far without the confirmation provided by this dominant social and technological infrastructure. If it was not possible to log on to the network and meet other people by exchanging email, for example, the image of the self as a "node in a network" would seem absurd. Like other hegemonic concepts, social networks are no longer just a metaphor but a metonymy, a substitution of a part (the Internet) for the whole (social relations of all kinds).

The appearance and now near-ubiquity of computer networks does not by itself explain why social scientists and members of the general public are so enthusiastic to equate people with nodes of a network. After all, networks of many kinds have existed for a long time (Mattelart, 2000). For example, by the middle of the 19th century, the telegraph network made it possible to transmit a message from Maine to Texas. But Thoreau (1980) made light of this in his famous comment: "We are in great haste to construct a magnetic telegraph from Maine to Texas; but Maine and Texas, it may be, have nothing important to communicate" (p. 52).

The mere existence of techniques or technologies of networks does not make them compelling objects of personal identification or (inter)national cohesion. Nevertheless, Thoreau's quip short-circuits the potential for a mutually recursive definition of the public and technology. In the words of John Dewey (1927):

Railways, travel and transportation, commerce, the mails, telegraph and telephone, newspapers, create enough similarity of ideas and sentiments . . . for they create interaction and interdependence. . . . Our modern state-unity is due to the consequences of technology employed so as to facilitate the rapid and easy circulation of opinions and information, and so as to generate constant and intricate interaction far beyond the limits of face-to-face communities." (p. 114)

In other words, Maine and Texas might not have had much to say to one another before the construction of a telegraph line connecting them, but the more the connection was used, the more they had to say, until constant contact between the two states forged a new bond between them.

Dewey's point is *not* that "the medium is the message" (McLuhan, 1994); rather, he states that the new connections between people established by modern technology engender an exchange of ideas. These ideas, as matters of public debate and concern, forge and divide coalitions of people into differing publics:

How can a public be organized, we may ask, when literally it does not stay in place? Only deep issues or those which can be made to appear such can find a common denominator among all the shifting and unstable relationships. . . . There are those who lay blame for all of the evils of our lives on steam, electricity and machinery. . . . In reality, the trouble springs rather from the ideas and absence of ideas in connection with which technological factors operate. (Dewey, 1927, pp.140–141)

Dewey's *The Public and its Problems* was a response to Lippmann's writings on the public and public opinion (Dewey, 1927, n. 1, pp. 116–117). In her rereading of this debate, "Issues Spark a Public into Being," Noortje Marres (2005) identifies a common understanding of the constitution of the public in Dewey and Lippmann's work. In Dewey's terms, a public is a form of association distinct from other types of community (e.g., friendships, religious groups, scientific communities):

The characteristic of the public as a state springs from the fact that all modes of associated behavior may have extensive and enduring consequences which involve others beyond those directly engaged in them . . . when a family connection, a church, a trade union, a business corporation, or an educational institution conducts itself so as to affect large numbers outside of itself, those who are affected form a public. (Dewey, 1927, pp. 27 and 28)

According to Dewey, publics are contentious in origin—the products of events in which a nonpublic group oversteps its bounds in ways that affect those outside its membership. Dewey's perspective allows one to account for the transitory, overlapping quality of "public" alignments of interests, but makes it difficult to understand in any precise way what "the public" is. "The public," as a single, unified entity, may, in fact, be just a fiction or *phantom* (Lippmann, 2002) of political maneuvering.

Marres pursues this picture of publics further in joint work with Richard Rogers (e.g., Marres & Rogers, 2005). The authors identify specific issues that

engender the formation of publics on the Internet (e.g., global climate change). These publics are organized into what they call "issue networks": think tanks, scientists, activists, NGOs, and others linked to strategically frame discussion and debate of objects of public concern (Marres & Rogers, 2005, pp. 922–923). They have also developed a software tool (IssueCrawler) that maps and visualizes these relationships in terms of hyperlinks between websites.

Network-based tools—like the IssueCrawler and many other works including my own Conversation Map (see Sack, 2002)—provide powerful representations of the metaphor of the "public as network." But these kinds of technology have limitations. Most important, networks are an adequate means for representing certain kinds of synchronic structural relations, but they provide no representational means to depict diachronic processes, that is, systems that change over time. Using networks it is difficult, if not impossible, to represent an event that might subsequently engender the development of a public motivated to assemble because of the event. The formation, development, and change of a network is outside the representational means of networks because networks are descriptions of structures, not processes. One might supplement this inadequacy by employing other means like content analysis, time series analysis, and so on. But this is the point: These other representational means are not the means of networks. Networks must be supplemented in order to represent change over time.

Marres (2005) has sought to address these representational shortcomings by offering a new metaphor—"object-oriented democratic politics" (p. 208). The new metaphor is an effort to engage not only the subjects of politics (i.e., the people that constitute a public) but also the objects of concern or contention (i.e., the issues that motivate a public's organization (ibid., p. 206)). In "From Realpolitik to Dingpolitik or How to Make Things Public," Bruno Latour (2005) discusses the metaphor's technological foundation:

A few years ago, computer scientists invented the marvelous expression of "object-oriented" software to describe a new way to program their computers. We wish to use this metaphor to ask the question: "What would an object-oriented democracy look like?" . . . It's clear that each object—each issue—generates a different pattern of emotions and disruptions, of disagreements and agreements. . . . Each object gathers around itself a different assembly of relevant parties. Each object triggers new occasions to passionately differ and dispute. Each object may also offer new ways of achieving closure without having to agree on much else. In other words, objects—taken as so many issues—bind all of us in ways that map out a public

space profoundly different from what is usually recognized under the label of "the political." (pp. 14 and 15)

Object-oriented programming was invented more than 40 years ago (Nygaard, 1962) and incorporates a means for describing both structures and processes. The definition of an "object" incorporates a description of its structure and a definition of associated processes (usually called "methods" or "handlers") that might be used to query or change the structure. For example, graphical computer interfaces are usually programmed using object-oriented methods. The interface's structures—its buttons, windows, menus, and their arrangement—are defined as objects and then handlers are added to the objects to define what should happen if, for example, a user pushes a button or clicks the mouse on an item of a menu. "Object-oriented publics" improves upon the network metaphor insofar as it both incorporates a means for describing processes—the dynamics and changes that can occur over time—and a framework for retaining distinctions between opposing entities. It enables us to ask a new set of questions about publics and their actions. Marres's anachronistic employment of a 1960s computer science term to characterize Lippmann and Dewey's ideas of the 1920s suggests the current fascination with networks may simply be one more metaphor in a long line of others. Soon, perhaps, it will be quite dated to imagine oneself as a node in a social network of Friendsters (see boyd, Chapter 8, this volume). Maybe, following the language of computer science, we will soon understand ourselves as "object handlers."

Stranger things have happened. For example, the notion of "open source" was originally a concept known only in technical circles: It describes a way of distributing software so that it can be shared, reused, and modified by subsequent programmers and users (see Weber, 2004). But now, "open source" is a form of art (Cramer, 2000), a national public radio program (http://www.radioopensource.org/), and is being applied to a large range of media for the purposes of articulating a new public space, a so-called "creative commons" (http://creativecommons.org/). In the world of software, object-oriented programming is a methodology that allows for wider sharing and reuse of good ideas. Object-oriented programming and open source are two complementary ideas from computer science. To imagine that we might proceed from thinking of ourselves as nodes in a network to inventing a self-image in the guise of an open source object handler cannot be any more whimsical than the industrual age's imagination that we are but cogs in the wheels of some enormous machine.

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11 Toward Participatory Expertise

Shay David

Most of us are familiar with the ways in which the Internet expands access to specialized knowledge such as medical information, legal advice, scientific research, and other domains of expertise. In many ways, the "databasing" of the world described by Geoffrey C. Bowker (Chapter 2, this volume) is also the process of disembedding information that was once more tightly bound to professional communities, with their tightly controlled forms of accreditation and membership. Several of the essays in this volume are concerned with the production of knowledge within more open, digitally mediated communities, and in particular with the ways in which technical architectures enable or constrain the production of new forms of expertise and authority within those communities. T. L. Taylor (Chapter 7, this volume), danah boyd (Chapter 8, this volume), and Robert F. Nideffer (Chapter 12, this volume) analyze different aspects of these broader *structures of participation* in our digitally mediated culture. This chapter focuses on online systems where the burden of legitimating knowledge production and incentivizing participation is explicitly embedded in the system architectures themselves—systems that manage reputations and rewards and structure editorial processes and community relationships. Through a series of short case studies of Wikipedia, Slashdot.org, Amazon.com, and Experts-exchange.com, this chapter explores the larger "solution space" of online knowledge communities and works toward a more general theory of the changing modalities of knowledge production and authority in digital culture.

The dynamic between accredited or expert knowledge and informal or practice-based knowledge has been a persistent focus of science studies, with numerous applications in science policy, workplace informatics, and system design. At a practical level, understanding the role of informal knowledge and patterns of communication within institutions and social systems has proven central to understanding and *improving the capacity for* change within those systems, ranging from changes in public policy to the successful introduction of new information systems within workplaces.[1] Such research has demonstrated that formal representations of knowledge flows—the chain of command or institutional flowchart are the classic examples—rarely provide adequate descriptions of how knowledge really circulates within institutions. The top-down application of expert decisions or institutional change may not acknowledge informal practices or have sufficient legitimacy to supplant them. This recognition has given rise not only to descriptive theories of knowledge systems but also to normative ones dedicated to

proving the value of extending the horizon of decision making beyond expert cadres.[2] Such work intersects a much broader tradition of democratic theory concerned with the administration of complex societies, with 20th-century American touchstones in the works of John Dewey and Walter Lippmann.

Our investigation of online knowledge communities raises two questions fundamental to this line of inquiry—one primarily political, the other sociological. First, what is the relationship between expertise and democratic governance in complex systems? Cadres of experts and institutions for training, certification, and accreditation are among the defining features of modernity and structure much of society's complex division of labor. Yet claims to superior knowledge sit uncomfortably with notions of democratic accountability. They operate in tension with the values of broad-based participation in decision making and public discourse, and of informed consent to authority.

For the sociologists Harry Collins and Robert Evans, this tension frames a dominant research paradigm within science studies. They call for the establishment of a research agenda dedicated to understanding the legitimacy of knowledge claims and, more specifically, expert knowledge claims in the encounter with larger publics (Collins & Evans, 2002, p. 235). For online knowledge communities that offer substitutes for the knowledge claims of professional groups, this problem is fundamental and two-sided. How, on the one hand, do online systems create legitimacy within their (large) user communities? And how do they establish it vis-à-vis (larger) external publics?

The second question puts us on terrain more familiar to sociologists of professions: Through what social processes do certain actors acquire "jurisdiction" over technical matters (Abbott, 1988)? In the cases of highly organized professions like medicine or law, this course involves processes of recognition by and institutionalization within society, with the grant of "exclusive rights" to members, professional bodies, and training and certification institutions. Professions manage knowledge—that is, they add to it but also, crucially, they regulate opportunities to acquire and exercise it, and, importantly, to exclude others from practicing their expertise within the regulated domain.

Across a wide range of fields, the freer flow of information made possible by the Internet has eroded these monopoly positions. Improved access to information and the empowerment of the end users is one side of this

story. New software-based community architectures for learning, gaining recognition, and developing and exercising expert authority is the other. Online knowledge communities encompass and blur these positions, making distinctions between production and consumption problematic. They struggle continuously and in highly concrete ways with what Collins and Evans call the problem of "extension," that is, the problem of understanding and managing the effective limits of participation and reliance on expert authority. As large, unbounded communities become producers and mediators of specialized knowledge, how do they organize the collaborative processes and what is the role of experts within it? Increasingly, the answer lies in the development of "reputation systems" within these community sites, systems that create and allocate forms of recognition, hierarchy, privilege, and authority within the community.

Online communities are important sites for understanding these dynamics because, increasingly, their designs speak directly to problems of legitimation and extension. The challenge here is not, strictly speaking, the "open source" paradigm, in which information production is tackled through large-scale, loosely coordinated voluntary efforts, but rather the subset of projects that embed the process of aggregation, filtering, and quality control in the system itself. These systems operate as real-life experiments in managing reputation, experience, and incentives for participation, directed both toward learning and applying complex bodies of knowledge. The most successful of them have not only mobilized large-scale participation but they have also adjusted to the emergent characteristics of the systems themselves, as users explore the opportunities and constraints of their online environments.

To reframe our starting question, then, this chapter explores how online knowledge communities address problems of legitimation and extension by privileging participation over prior accreditation at the level of the system architecture itself. The four cases examined here—Wikipedia, Slashdot.org, Amazon.com, and Experts-exchange.com—permit a rough sketch of the "solution space" that defines (and limits) these communities and their encounters with educational systems, professions, editorial norms, and other more established systems of knowledge production.

At a moment when our concept of democracy has not acquired much purchase over the technical architectures of our shared digital culture, these community systems are actively reconstructing concepts of accountability,

transparency, and public deliberation. How far they can go in deferring problems of scale (extension) and in surmounting their narrow project boundaries is—I would argue—a fundamental question for both the social and technical sciences that has only begun to be explored.

community expertise

Wikipedia is the largest encyclopedia in the world, with more than 1,000,000 entries in English (as of January 2007) and millions more entries in other languages. Wikipedia entries are open to and editable by the public. There is no centralized editorial control or allocation of entries to experts. Contrary to most norms of editorial process and quality control, Wikipedia demonstrates that—under some circumstances at least—large numbers of amateur contributors can create a dynamic in which "good' information drives out "bad," leading to a form of conditional authority vested in the collaborative editorial process itself, rather than in the contributions of individual authors.

Slashdot.org is a technology website that advertises itself as "news for nerds." It combines the functions of a news syndication service with those of a "letters to the editor" section. As a community architecture, Slashdot relies on a system of user feedback to dynamically allocate privileges to comment and contribute. This system establishes rank within the Slashdot community, measured in capacity to shape the content of the site and empower other users to do so. Slashdot has tremendous authority in the world of "geeks," and claims more readers than *The New York Times*.

Amazon.com is the world's largest book and CD store and is becoming an important retailer in other domains (mostly electronics and toys). It sells items directly but also facilitates a market for users to transact with one another. It does so, in part, via a complex system of user reviews, which have helped consolidate a form of community authority over markets in which information flows between peers (usually customers), instead of residing primarily in advertising copy. The Amazon review process allows users not only to review items but also to construct identities as expert reviewers and promote their social agendas.

Experts-exchange.com is a community for "trading" programming knowledge. It supports a marketplace for knowledge that uses a currency called "points," which reflect ongoing collective judgments about the reputations and contributions of community members. Users spend points to obtain answers to questions and earn points by answering other users' ques-

tions. The points economy anchors a system of recognition and reputation and provides a proxy for expertise and social capital.

At the heart of these systems is a new means of addressing a familiar problem of social scale. In small communities, expertise can be recognized and affirmed through personal contacts—news and reputation spread fast in small networks; reputation can be both enduring and "thickly supported" by multiple interactions. In large communities, in contrast, personal contacts are much less likely to be adequate for this role. Although the social distance between actors scales much more slowly than the population size—reflecting the "small-world" characteristics of human societies identified by network theorists—size and complexity have necessitated many forms of signaling of roles and expertise, from diplomas to uniforms. Systems of accreditation exist, in part, to solve the information problem inherent in large social networks: how to provide low-cost signaling of expertise in contexts where personal relationships map only a small portion of the population. The systems discussed here are attempts to bridge this difficulty, scaling up toward large populations while ignoring a priori accreditation as a basis for expert legitimation. Expertise in these communities is a continuous category, generated through a feedback loop between participation and community recognition. In practice, the distinction between expert and layperson is often diffuse or transitory. In some systems, the software architecture tries to associate expertise with community authority, the latter defined as the ability to shape the participation of others within the online space. In other contexts, expertise and authority are more granular, valid for a short time or within a subdomain. The power relationships that structure most expert–lay distinctions are filtered through this more fluid conception of roles and community, in which the interaction is not simply about problem solving by experts, but also an occasion for the transmission of knowledge and the reproduction of expertise.

Under these conditions, expertise is not strictly or solely vested in individuals. In many online communities, the notion of community expertise plays an important role. Community expertise resides in two competing dynamics: (1) the legitimation of "aggregate" opinion, as opinions tend toward an equilibrium, even on controversial issues; and (2) the openness of the community to dissenting opinions, with the potential to change the aggregate consensus. In successful online communities, these dynamics produce confidence in the knowledge-making process, rather than confidence

in any particular instance of expert opinion. The system is legitimate to the degree that it represents a properly constituted authority in the eyes of the community of users.

case study: encyclopedias without borders

Wikipedia's magnitude of many millions of articles dwarfs E*ncyclopedia Britanica*'s 80,000 articles and *Encarta*'s 40,000 (Pink, 2005). Wikipedia is the highest-profile application of MediaWiki, a software tool that, like other "wiki"[3] software, creates an open-community development space for viewing, editing, and linking web pages. Wikipedia is free to users; its low operating costs were initially covered by private donors and later supplemented by institutional contributions. For a site that shifts editorial and authorial functions onto a volunteer community, this openness is a condition of success. The system allows information consumers to become information producers at nominal cost. Of equal significance, it draws no distinctions between the latter group: There is no space for asserting credentials or other "outside" expert privileges; the system makes no judgments about the sources of knowledge held by participants.

In practice, almost all major articles are collaboratively authored, sometimes by dozens or hundreds of contributors. Contributors can register and acquire "verified" identities, or remain unregistered and anonymous. This distinction has underwritten a dynamic in which most new entries come from registered users, whereas anonymous users are more often associated with the editing of established entries.[4] Many entries follow a predictable pattern of expansion and consolidation as participants add to articles, and as this (often disorganized) accretion raises incentives for major consolidating edits. The open structure leads to volatility when proponents of hard-to-reconcile positions dispute entries. This dynamic tends to favor the most committed posters, who can devote more time and energy to monitoring the editorial process. (Like other wikis, MediaWiki allows users to roll back pages to earlier versions.) Persistent conflict in some Wikipedia subcommunities led to the establishment of a code of etiquette in 2004, defined primarily by bans on personal invective and a "three revert rule" that limited the number of reversions allowed within a 24-hour period. A court of arbitration was established to exclude offenders from the site.

Although some disputes have occasioned considerable ill will, Wikipedia continues to grow because the community process operates sufficiently

well to resolve most conflicts within posting communities. The community for any entry forms in a back channel to the entry page—the Talk page—where content changes are explained and negotiated. By most accounts, major disputes are infrequent, and contentious topics tend to stabilize around consensual language. Cases of vandalism are usually self-healing, often within a few minutes (IBM, 2005).

Wikipedia has been used as an example of paradigm shift in the production of knowledge goods, from production by hierarchical organizations (e.g., firms) to what Yochai Benkler (2002) calls the rise of "commons-based peer production," characterized by a broad-based community model coordinated by new communications technologies. Although open source software is the usual reference point here, the history of encyclopedias can also be reframed through this lens:

> **In the beginning, encyclopedias relied on the One Smart Guy model. In ancient Greece, Aristotle put pen to papyrus and single-handedly tried to record all the knowledge of his time. . . . [In] the 1700s, Diderot and a few pals (including Voltaire and Rousseau) took 29 years to create the Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers. With the industrial revolution, the One Smart Guy approach gradually gave way to the One Best Way approach, which borrowed its principles from management science and the lessons of assembly lines. Encyclopedia Britannica pioneered this approach in Scotland and honed it to perfection. Large groups of experts, each performing a task on a detailed work chart under the direction of a manager, produced encyclopedias of enormous breadth. [Wikipeida represents] a third model—call it One for All. Instead of one really smart guy, Wikipedia draws on thousands of fairly smart guys and gals. . . . Instead of clearly delineated lines of authority, Wikipedia depends on radical decentralization and self-organization—open source in its purest form. Most encyclopedias start to fossilize the moment they're printed on a page. But add Wiki software and some helping hands and you get something self-repairing and almost alive. A different production model creates a product that's fluid, fast, fixable, and free. (Pink, 2005)**

Pink's conclusion echoes Wikipedia's own description of its virtuous circle between process and content. For Pink and the Wikipedia staff, Wikipedia is not just a new way to write an encyclopedia but also a better epistemological model, rooted in greater responsiveness to change and a range of less tangible assertions, including the claim that the accuracy of the encyclopedia improves over time:

As anyone can edit any article, it is of course possible for biased, out of date or incorrect information to be posted. However, because there are so many other people reading the articles and monitoring contributions using the Recent Changes page, incorrect information is usually corrected quickly. Thus, the overall accuracy of the encyclopedia is improving all the time as it attracts more and more contributors. You are encouraged to help by correcting articles and passing on your own knowledge. (Wikipedia FAQ, 2005)

This set of claims should be read as Wikipedia's central social and epistemological hypothesis: Unstructured collaborative authorship yields not just community, but quality. No one doubts that significant parts of Wikipedia realize this promise, although there has been no systematic survey or effort to establish criteria of comparison. It is clear that not all entries enjoy this virtuous dynamic; Wikipedia's coverage is strongest where subjects attract high degrees of attention. Although Wikipedia covers an astonishing range of obscure and minor topics, many of these are the products of single or small-group authorship. In these circumstances, outliers in quality and "bias" are frequent.

Because of this variability, Wikipedia has been met with recurrent questions about trust and authority, especially as its explosive growth brings it into contact with communities with other habits and expectations of expert reference. Representatives of traditional editorial cultures have weighed in, the most visibe and visceral being Robert McHenry (2004), a former editor in chief of *Encyclopedia Britannica,* who compared Wikipedia to a public restroom, which one can use in times of need, not knowing who used it before. But questions have also been articulated from within the community of users, partly in an effort to articulate the goals of Wikipedia and examine the consequences of its openness. How authoritative is Wikipedia? For whom? Compared to what? What does trust mean in this context?

Wikipedia's lack of a system for distributing authority among its participants—whether based on software-defined "karma" or community recognition or some other mechanism—makes it uniquely open but also uniquely weak in its ability to articulate enforceable standards over practice or content. The back channel negotiation over entries fulfills this function in a limited, local sense, but at any time dialogic authority can be trumped by those wielding more free time. The lack of endogenously developed leaders who can wield greater power within the community is a design choice, one that reflects Wikipedia's claims about the relationship between breadth of partici-

pation and quality of outcome. For Larry Sanger (2004), a Wikipedia founder and subsequent critic of the open editorial process, this belief is inseparable from a broader anti-elitism in the Wikipedia community, which not only insists on the invisibility of credentials but also actively disrespects expert opinion. He notes the possibility of a negative dynamic in which experts are driven away through their parity with ignorant contributors. Sanger envisions an eventual "fork" in the project, in which Wikipedia is reconstituted around an editorial committee; more recent conversations about Wikipedia have discussed the possibility of a print version built on editorial review, or of a rolling "accreditation" of vetted versions of important pages. Such compromises become important as Wikipedia's owners begin to conceive it as more like *Britannica,* with corresponding responsibilities toward verifiability, stability, and "citability," and less like the vast but unpredictable knowledge base of the Internet. How such steps would affect the community dynamic that sustains Wikipedia is unclear. Distancing a premium product from the community process will alter the sense of community responsibility over entries. Freezing or publishing "high-quality" entries reintroduces problems of the scalability of production that the wiki enterprise was intended to overcome. Wikipedia, like the larger open system of the Internet, is charting new territory in which widespread use is not contingent on widespread trust, at least on the terms established by earlier expert systems.

case study: distributing the news—all the news that fits the screen (and then some)

Slashdot.org's tagline, "News for Nerds—Stuff that Matters," states a challenge familiar to many media organizations: how to decide what is "fit to print," in the sense of meeting the expectations of its community of readers. Slashdot started in 1997 as a simple bulletin board for referencing technology-related news articles; it encouraged readers to link to articles and to add unmoderated commentary. As the site grew, its nondiscriminating editorial policy began to break down. The site was overwhelmed by submissions: It was unclear how to keep content fresh as old material remained active, or how to prioritize good over bad content. Twenty-one-year-old Rob "CmdrTaco" Malda, Slashdot's founder, understood two things about this process: (1) The main value of the site resided in the user comments, not the stories (which were published first elsewhere); and (2) the only way to scale Slashdot was to leverage the community's cognitive power. Rather than

create an editorial hierarchy, Malda developed a community-based selection process built into the architecture of the site that relies on moderation and "karma points" in order to control the way users submit and rate comments. The system rewards both participation on the site and community judgment of that participation. As the Slashdot FAQ (2005) explains:

> **Karma is the sum of your activity on Slashdot. This means posting, moderation, story submissions. . . . Karma is used to remove risky users from the moderator pool, and to assign a bonus point to users who have contributed positively to Slashdot in the past.**
>
> **Your karma is a reference that primarily represents how your comments have been moderated in the past. Karma is structured on the following scale "Terrible, Bad, Neutral, Positive, Good, and Excellent." If a comment you post is moderated up, your karma will rise. Consequently, if you post a comment that has been moderated down, your karma will fall. . . . In addition to moderation, other things factor into karma as well. You can get some karma by submitting a story that we decide to post. Also, meta-moderation can cause your karma to change. This encourages good moderators, and ideally removes moderator access from bad ones. . . . Note that being moderated Funny doesn't help your karma. You have to be smart, not just a smart-ass.**

Every 30 minutes, the system distributes "tokens" to users based on the number of comments posted. These tokens turn users into moderators and are valid for three days. Comments float up or down on the story page based on the aggregate judgments of the moderators. Comments whose ranking drops below a certain threshold are no longer displayed. Skill in ranking stories and comments creates a feedback loop in the form of karma points, which allow users to build both reputation and influence within the system. The point system is layered to permit the acquisition or loss of karma across several forms of participation on the site. It is important to note that the system is not completely open: initial submissions are filtered by a core group of "authors" (i.e., editors). The community does the rest, deciding what matters and what does not.

Through this process, the expert function of editors in the selection and qualification of content is shifted to the Slashdot community. Like Wikipedia, participation is not conditioned by any a priori qualifications (like Wikipedia, there is a free process of registration.) Unlike Wikipedia, however, Slashdot's system is designed to produce a hierarchy among the

contributors. Through the acquisition of good karma, moderators can influence the visibility of stories; their actions carry disproportionate weight in a context in which comments on stories often number in the hundreds. The moderator is not defined by substantive expertise—although he or she may possess it—but by a stronger investment in the community and a superior ability to cater to its information needs.

Since its founding almost a decade ago, revisions to the Slashdot architecture have been motivated chiefly by challenges of scale—how to maintain a relatively open community and a relatively efficient filtering mechanism for information as membership grew (from 10,000 articles in the year 2000 to 10,000,000 postings in 2004). There have been several such revisions in this period, including the major shift to the karma-based system of metamoderation in 1999. An unintended consequence of this growth and efficiency is the emergence of the "Slashdot effect"—the "roving random distributed denial of service attack," according to Wikipedia, that can occur when participants visit websites identified in popular posts en masse (usually the victims are small websites with limited server capacity or bandwidth). Slashdot, unlike Wikipedia, Amazon, and Experts-Exchange (discussed below), does not internalize its transactions—its product is the collective attention of its members focused on stories outside the site. In economic terms, the Slashdot effect is a negative externality of the production process. And although it was first identified on Slashdot, it comes into play in many large online communities dedicated to efficiencies in the attention economy—to the filtering of news or other information on the Web.

case study: book reviews and the politics of experience

New York Times Book Review editor Charles McGrath recently asked, only half in jest, whether "there had ever been a book that wasn't acclaimed" (Safire, 2005). McGrath's comment was directed at the "praise inflation" in book promotion and the perceived resulting decline in the usefulness of reviews, blurbs, and other commentary as indicators of quality. Traditionally, the critics employed by institutions like *The New York Times* or other leading newspapers and trade magazines served as cultural gatekeepers, shaping wider public perception of the quality of a work. In recent years, however, the overabundance of books, CDs, and other media has precluded comprehensive coverage by small groups of paid experts. Filling the gaps are a wide

variety of trade publications and websites that cover more specialized subfields of the culture industries and increasingly employ systems that harness the power of user communities in offering critical assessments of works. In many areas of cultural production, user reviews are mushrooming as an alternative to traditional expert reviews.

Amazon's online review system is a pioneering example of an increasingly common class of commercially oriented community review systems. The Amazon system manages an "accreditation community" around its products, with multiple layers of contributors, avenues for participation, and mechanisms for dynamically assigning visibility and credentials to popular reviews and reviewers. The system is structured in terms of what I have elsewhere called the "six degrees of reputation" of online expert systems (David & Pinch, 2005). Amazon's representation of a work is shaped by this dynamic process, which integrates the reputation effects of (1) the authors or creators themselves, whose name recognition and reputation accompanies the work; (2) promotional book reviewers, drawn from media sources or produced for Amazon by its employees; (3) community reviewers and participant-authored "best-of" lists, which also provide an opportunity to rate the work on a numeric scale; (4) reader judgments of the book reviews (useful/not useful), with an option for reporting inappropriate reviews; (5) a dynamic feedback mechanism for reviews that adjusts their visibility based on community opinion (usefulness) and reviewer rank; and (6) a dynamically adjusted system for reviewer rank, reflecting the amount of reviews posted (level of contribution) and the usefulness quotient (quality of contribution.) Reviewers that reach the upper ranks of the list receive visual accreditation in the form of an icon next to their name: "Top 100 reviewer" (or 500, 1,000, etc.). Top 20 reviewers receive a personal profile that accompanies their reviews.[5]

Amazon has a clear stake in managing the economy of trust within its review system. Recent qualitative research suggests that the review dynamic can positively affect sales (Chevalier & Mayzlin, 2004), providing a definitive commercial metric for the system. Amazon's reviewer ranking—especially the personalization of reviews that accompanies high rank—is an effort to replicate the perceptions of trust that underpin a managed editorial process. This takes precedence over, and in most instances displaces, the community building that accompanies the back channel exchanges on Wikipedia, as well as the social networks and system of interpersonal recognition that underpin editorial privileges on Slashdot. It is much closer to the signaling function of

formal credential systems in large offline networks (e.g., university degrees or uniforms), where the primary function is not to ground a social relationship but to enable the low-cost negotiation of reliable information or services. In other words, Amazon does not have a community in the senses described above; it has customers, and consequently does not confuse process with product. Like Slashdot and similar systems, it supports an open process of accreditation that operates without reference to an established norm or corpus of knowledge. Authority is generated through the process, and other members of the reviewer community are the only points of reference.

Is the information generated in this system trustworthy? Recently, a technical fault on the Canadian division of Amazon revealed the identities of several thousand of its "anonymous" reviewers, and alarming discoveries were made. It was established that a large number of authors had received glowing testimonials from friends, husbands, wives, colleagues, or paid professionals. A few had reviewed their own books or launched attacks on rivals. The fact that the system survived this scandal doubtless reflected a variety of factors, such as the complex shaping of taste and opinion that make the review system only a partial (and highly substitutable) factor in book purchases. But it also arguably reflected a number of overlapping dynamics particular to the architectural choices of Amazon and other commercial sites: (1) the thinness of community investment in the review process, which made corruption by individuals less of a collectively felt affront; (2) the force of numbers and consensus in the review process, which underpinned a stable—if not dialogic—structure of community expertise; and (3) the metaranking mechanism itself, which offered a modest check on reviewer power.[6]

case study: experts-exchange
allowing experts to exchange expertise and reputation

Experts-Exchange.com is a peer-to-peer community specializing in the trading of technical support and other IT-related knowledge on topics ranging from operating systems to networking, programming, web design, security applications, and much more. The community is built on question-and-answer transactions between members filtered through a system of "points," which operates as a form of internal pricing system. Points ground a reputation system that rewards those who can provide answers. Over time, the accumulation of questions and answers has produced a large knowledge base available to all members of the community (as of January 2007, the site listed

over 15 million questions). The site is oriented toward technology professionals and has more than 220,000 registered users (as of January 2007). Questions range from the trivial (the second most popular question is "How do I recover a lost Windows administrator password?") to complex programming issues. The large number of participants raises the likelihood that even highly specialized questions will find an answer very quickly (something this author can attest to through participant observation).

Experts-Exchange thus has a strong problem-based orientation, a community dynamic, and a system of rank that distributes visibility (like Amazon), but not power (like Slashdot) within the community. Unlike Wikipedia, it requires neither user collaboration on the end products (answers), nor does it appeal to an abstract epistemology (neutrality, objectivity) to ground the legitimacy of answers. Questions give rise to dialogue between participants, and answers are valid when the poser of the question is satisfied. The technical nature of the material ensures that the knowledge transacted is verifiable: An answer either solves the problem or it doesn't, and this can be determined very rapidly.

The site's knowledge economy revolves around two types of points: "question points" and "expert points." Registered members receive five question points every day, cumulative to 500, which they can assign to new questions. The points system enables some flexibility in signaling needs. The number of points assigned to a question may not indicate the difficulty of the answer, but rather a need for rapid response. The greater the number of points assigned to a question, the higher the incentive for community members to answer it. When another member takes up a question, an online conversation ensues until the question is answered to the satisfaction of the poser. Sometimes other experts join the thread. If the poser accepts an answer as valid, the points attached to the question are transferred to the appropriate responder. In addition, the poser submits a numerical grade of the quality of the answer in function of the difficulty of the question and grants the responder expert points equal to the question points multiplied by the number grade. Although the difference seems subtle, the second type of point permits recognition based not just on an a prioiri valuation of the knowledge sought, but also on the quality of the interaction and the virtuosity of the response. Expert points are the glue of the community.

Members are ranked based on total points, and these ranks are visible to the community. Like on Amazon, rank equates with personal visibil-

ity to the larger community. These signaling mechanisms include entry into a Hall of Fame, with personal profiles, printable certifications that reflect points accumulated (ranging from Master at 50,000 to Genius at 1,000,000), and awards like Expert of the Year and Most Valuable Experts. Such recognition structures mimic traditional forms of accreditation in some respects but, importantly, are intended to incentivize participation, not serve as a prerequisite to it.

Because questions and answers accumulate in a searchable knowledge base, Expert-Exchange fosters the growth of a knowledge commons that benefits the whole community. The knowledge commons includes answers to a vast array of common questions, which no longer need to be processed through the community dynamic. Because Experts-Exchange's role is limited to that of a transaction broker propelled by a modest reputation system, it manages to separate expertise from authority. Authority over the community is negligible in this structure: Expert status conveys no ability to shape the participation of others, nor can question posers steer their requests toward reputable experts. Members self-select on both sides, providing an example of the virtues of open systems in the allocation of limited resources: time and expertise.

toward a taxonomy of online knowledge communities

The above comparisons suggest that the design of online knowledge communities—at least in this early phase of development—operates within a relatively small "solution space," marked by a few recurrent tensions and tradeoffs. Our very preliminary account suggests important distinctions between:

- **Reputation systems that reward performance with *visibility within* the community versus those that distribute *authority over* the community (Experts-Exchange vs. Slashdot). The two are not mutually exclusive, but mark a distinction between "soft" and "hard" power in these communities.**
- **Reputational rewards based on substantive knowledge of a topic versus reputation based on the ability to reflect community preferences (Experts-Exchange or Wikipedia vs. Slashdot). The categories blur where process expertise involves catering to a community based in substantive expertise, as in the case of specialized editorial and filtering work.**
- **Systems that favor the experience of community versus those that privilege the production of knowledge goods. Arguably, both the problems and strengths of Wikipedia reflect a structural lack of clarity on this issue.**

- **"Bounded" knowledge systems that internalize their products versus unbounded ones that repackage and affect resources distributed across the web. The "internal transaction" orientations of Amazon and Experts-Exchange versus the news-filtering function of Slashdot illustrate this dynamic. Google is arguably the extreme case: a mechanism for distributing visibility so ubiquitous that it virtually defines its environment.**

The new structures of participation in online communities are built around these parameters, and create new—if still only modestly exploitable and experientially thin—opportunities for learning, sociability, and advancement. It seems likely that the scope and character of these opportunities will grow as the architectures for online communities become richer and more sophisticated. Stronger approximations of "offline" systems of identity, dialogue, experience, and trust will continue to offer tempting directions for development. At present, these systems offer very thin representations of human experience; the exclusion of a priori credentials is also, in large measure, the exclusion of the authority of the past. The premium placed on participation is a premium on *current participation,* whose benefits erode rapidly with disuse. Although these systems have articulated new strategies for addressing problems of scale within community-based reputation systems (thereby pushing the problem of extension further back than previously thought practical), it may be that the limits of the attention economy prove less flexible. Advancement within these systems, to date, is often an exercise in singular and constantly renewed devotion, a fact that may limit their growth or raise incentives for new, portable, persistent forms of reputation.

The disempowering of the past associated with these systems is accompanied, ironically, by a near-complete capacity to record and search that past. These systems have long "community memories" that preserve not only records of achievement, but also the complex social negotiations that produced them, including dissenting opinions, past revisions of articles, rejected answers to technical questions, low-rated commentary, and so on. Collectively, these records trace the community's shared experience in addressing both substantive questions and process concerns. Theoretically, these histories are available as a resource to the community, but the practical impact of this preservation is unclear. Online knowledge communities lack historians.[7] More precisely, they lack history functions: systems that would expose the historical record of the community and integrate it into present practice.

toward a reputation society

Like other aspects of digital culture, online knowledge communities are social laboratories where community values, goals, and modes of interaction must be designed rather than received. The variations on the theme are also explorations of how basic social parameters translate into the much thinner context of digital sociability (danah boyd [Chapter 8, this volume] has explored this question in relation to social networks). The reputation systems that structure these communities illuminate a much broader dynamic between reputation or authority derived from a community, and credential systems that bring authority to communities. Online knowledge communities are not microcosms of these larger social systems but new formations within and in continuity with them. Looking forward, one of the most interesting questions for online knowledge communities is how this contact—and even competition—with established knowledge systems will be negotiated. The trials of Wikipedia are probably just an early taste of this process of integration. It involves both the (currently minimal) portability of personal reputations built within these communities and the reputation of the community knowledge base itself vis-à-vis other, more established knowledge producers. Most definitely, it involves the market power of these large new participatory publics and the resulting incentive for traditional media and expert communities to accommodate themselves to emergent forms of accreditation and reputation. A cursory look at book ads in the *New York Times Book Review* suggests that this process has begun: For example, a recent novel *Twilight* is advertised as "A *New York Times* Bestseller," "A *Publisher's Weekly* best book of 2005," and "An Amazon 'Best book of the decade . . . so far.'"

Many participants in and observers of these communities have high expectations for this encounter, and indeed envision community-based reputation systems as a potentially powerful force in opening forms of technocratic decision making to democratic participation and scrutiny. Hassan Masum and Yi–Cheng Zhang (2004) make this connection in their "Manifesto for the Reputation Society":

> **Our judgments on any complex topic are inevitably transmitted to each other in an incomplete and distorted fashion. The task of reputation system designers is then to set up incentives that minimize inaccuracies and maximize productive collaboration, so that wherever possible the judgment of a group—or indeed, of an entire society—becomes better than the judgment of its individual members.**

What would be involved in using community-based "karma" to manage reputation and authority in traditional professional domains? Such extensions are not impractical: the site RateMyProfessor.com, for instance, aggregates and quantifies the array of informal college student–circulated information about classroom teaching. It tries to objectify an aspect of professional performance that has no organized metric or feedback mechanism within the academy. Other systems, like Wikipedia, more directly confront existing professional prerogatives. Looking forward, the test of community-based knowledge communities in the broader public domain is not whether they generate relevant information, but how they negotiate the border with established systems of knowledge production, expertise, and credentialization. In thinking about a normative theory of expertise—of what kinds of expertise we should empower and respect—online knowledge communities show us, at the very least, how to place a premium on those modes that report to a large community. After the fundamental principle of open source code—of technical architectures exposed to public scrutiny—online knowledge communities may be the second democratic innovation of digital culture.

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notes

1 See, for example, Orr (1996) on the role of informal knowledge sharing among Xerox repair men, and Wynne (1989) on the response by local sheep farmers to post-Chernobyl nuclear fallout in northern Britain.

2 See Epstein (1995) on the importance of the use of lay experts in the early days of HIV medication clinical trials. See also Hilgartner (2000) on the construction of expertise as a form of public performance.

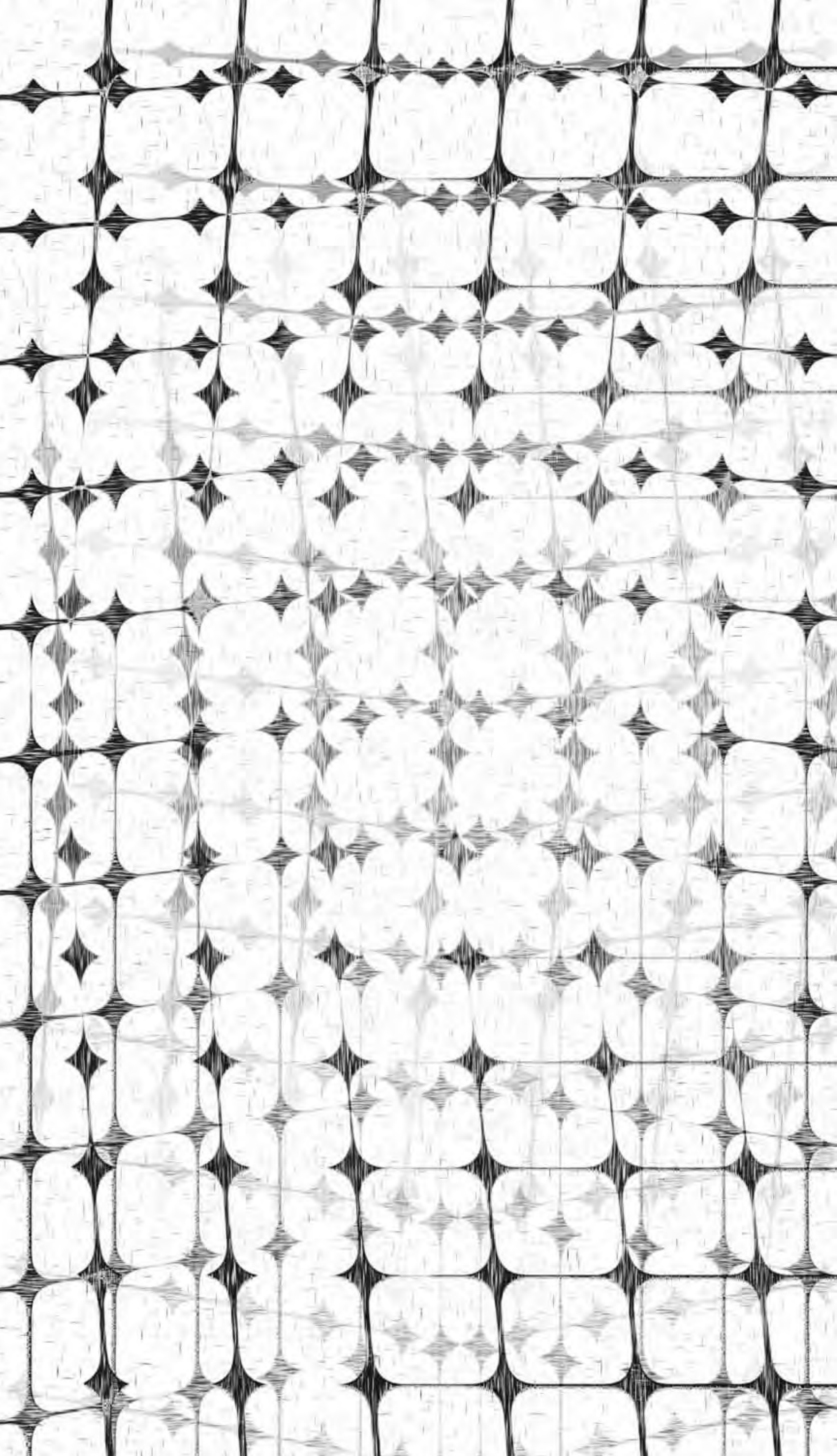
3 *Wikiwiki* is the Hawaiian word for quick.

4 The distinction does not appear to translate into measurable differences in quality: The quality of anonymous contributions is comparable to that of registered users (Anthony, 2005). Anonymity has shielded periodic, and occasionally much remarked, abuses of the system, including the notable false biography of former presidential aide John Seigenthaler (Terdiman, 2005), which occasioned a minor scandal in November 2005. In order to discourage malicious posts, Wikipedia founder James Wales announced in December 2005 that all contributions would require user registration. It is less clear how this will meaningfully verify identity, since false registration is quite simple under the current system.

5 The six-degrees model is useful for analytical purposes, showing how reputation is built into different layers of the system. In reality, many users “game” the system, trying either to promote an agenda or build their own identities. A full account is given in David and Pinch (2005).

6 Compared with Slashdot, Amazon’s feedback mechanisms (in 2005) are fairly rudimentary: Usefulness is a binary ranking condensing a wide range of possible opinion (e.g., something can be useful but not accurate, or not useful but funny). This metaranking affects the order of the reviews on the site.

7 Distinct from Crane’s vision (Chapter 3, this volume), of a vastly enriched experience of history built on location-based technologies, there is growing concern in the academic history community about the lack of tools for understanding online and other electronic forms of social experience, which have no spatial referents or necessary connection to broader matrices of human experience. Although online activities are, in many respects, more transparent and recordable than many “real-world” events, as a practical matter there is little systematic capacity or perceived need to preserve this history, or render it tractable to analysis. The Center for History and New Media at George Mason University (http://chnm.gmu.edu/about.php) hosts a project on the history of Wikipedia and of open source software projects that represents one effort to address this growing gap.



12 Game Engines as Open Networks

Robert F. Nideffer

Electronic games have become hugely popular, and are now claimed to be the favorite form of entertainment in the United States. According to a summary of recent studies compiled by the Entertainment Software Association,[1] two times as many people polled preferred playing games to watching television, while three times as many people preferred games to renting movies. The average gamer is 29 years old. The average American youth spends between 7 and 30 hours per week playing. Nearly 50% of players are now reported to be women (IDSA, 2003). Within the video game industry, there is general consensus that a large part of the future of games lies on the Internet. Games will proliferate across devices, touching anything that is able to access the Internet: console systems like the Xbox and Playstation, desktop and notebook computers, Tablet PCs, Smart Displays, PDAs, mobile phones, set-top boxes, and so on (Wolf, 2003). This proliferation is already well under way.

According to a report from market analysts The Themis Group, massively multiplayer online games (MMOGs)[2]—games that involve tens of thousands of concurrent players and millions of registered players in persistent online worlds—generated roughly $1.3 billion during 2004 and will increase to an anticipated $4 billion or more by 2008. The bulk of this will come from subscriptions, but a growing proportion will be generated by the sale of virtual property and in-game items (BBC News, 2004). By 2010 it's anticipated that the installed base of mobile game users alone will reach 2 billion (Hamilton and Stevenson, 2005). In 2000 Internet penetration exceeded 50% in the United States, with more than 53 million households connected. In 2004, according to a new study released by research firm Nielsen Netratings, three out of four Americans, or a total of 204.3 million people, had access to the Internet (Gruener, 2004).

One of the key enablers of this kind of growth has been the development and refinement of the "behind-the-scenes" software that makes games run, commonly referred to as the "game engine." The term is usually applied to the software infrastructure that renders everything you see and interact with in the game world. Game engines provide the graphics capabilities, the physics models, the collision detection, the networking (when present), and the core functionality the player experiences during game play. Elsewhere I have argued (Nideffer, forthcoming) that one can think about the game engine as a culturally encoded "database interface," that is, a mechanism through which a predetermined, relatively constrained collection of socially sanctioned procedures and protocols is used to render a world and make it

navigable in context. Along these lines, I have argued that it's important to look at the game engine as a cultural artifact that circulates within a specific social domain, in order to begin thinking about how to make more visible the implicit and often taken-for-granted assumptions operative during software development, as well as to extend the boundaries of what constitutes the game engine. I have done this in an effort to move beyond thinking of the game engine strictly in software engineering terms, and in an effort to also think about it in social engineering and networking terms.

My goal here is to examine the ways in which Internet gaming is beginning to address a fundamental social and technical challenge for digital culture: the relationships between the technical challenges of ubiquitous computing, the new social and creative opportunities available to users, and the persistent commercial pressure to segment online networks into private monopoly domains. I take up the fundamental and newly threatened issue of interoperability and openness within networks. As both work and play become articulated through online systems, these dynamics affect our capacities to reinvent our environments in fundamental ways—to affect not only the *content* of structured interactions but also the infrastructure and *context* in which they play out.

This chapter maps these dynamics through a series of short case studies of the social, technical, and commercial challenges associated with the "engines" that drive networked games and gaming:

- **KALI: the first internet gaming platform**
- **BNETD V. BLIZZARD ENTERTAINMENT: a legal case that challenges issues of interoperability**
- **MAJESTIC: an ambitious though unsuccessful commercial title released by Electronic Arts in 2001 that incorporated a variety of mixed-media devices**
- **UNEXCEPTIONAL.NET: an open source net-art project that integrates blogs, location-aware mobile phones, and 3D game clients**

kali

Although little acknowledged, computer games have been at the forefront of many core areas in the computer and engineering sciences and have essentially supported multiple players since their inception several decades ago. The earliest and perhaps most prominent example is *Spacewar,* which came out of the Massachusetts Institute of Technology in the early 1960s and was

initially implemented on a giant TX-0, the world's first online time-shared computer. What is seldom reported is the role that the TX-0 played, as an infrastructure platform, in ushering in the next generation of designers and programmers. Early experiments on the TX-0 included not only *Spacewar,* but other game and gamelike programs such as *Bouncing Ball, Mouse in the Maze,* and *Tic-Tac-Toe* (Graetz, 1981). Initially, multiplayer meant little more than one user taking turns on the same computer at different times. However, it was not long before multiple players were able to use different input devices on the same machine simultaneously. Eventually, with the advent of personal computing and the ability to both create local networks between multiple machines (using cables), as well as connect to other players remotely (through IPX networks and ultimately via the Internet), people started designing and playing "networked" games in which physical copresence was no longer required.

What is particularly interesting about the cycle of development linking computing, gaming, and networking is how it arose out of a collective desire not just to play, but to play *together.* Games, or for that matter computer-mediated social interaction, had never been integral parts of the early visions of mainframe computing, personal computing, or networked computing. In each case, however, games and social network support became an early and ubiquitous unintended consequence. They were almost always the first direction of unofficial user-driven development of systems and have driven advances in many areas of computing, from graphics software and hardware to input devices, networked operating systems, multimedia delivery, and integrated communication protocols (e.g., those combining chat, email, instant messaging, voice-over Internet protocol, fax, and global positioning systems).

The first robust program facilitating Internet gaming was Kali, a system developed in the mid-1990s by two independent programmers, Jay Cotton and Scott Coleman. Kali was a software solution for connecting multiple machines together, whether located remotely or in physical proximity. It performed a few simple functions: initiate and verify connections with all players in the game and configure it dynamically so that all machines are using the same set of game parameters; support an Internet Relay Chat–like mode whereby players could communicate once connected; and provide an online player directory so that opponents could be selected from a list (Cotton, 1994).

Kali—named after a goddess of death and destruction—was first used to support *Doom*, the groundbreaking, ultraviolent first-person-shooter (FPS) game released in 1993. Kali changed the way *Doom* was played, shifting the dynamic from a person–computer interaction to a much more social experience in which multiple players competed or cooperated in the same online environment. Going far beyond the editable parameters exposed by the designers themselves—difficulty, speed, and so on—Kali opened up a new form of play. It encouraged players to take part in the construction and manipulation of their experience at a deeper and more fundamental level than those enabled through the consumer interface. It traded transparency in the sense favored by game designers of a minimally intrusive interface, for transparency in the sense favored by hackers (and, not incidentally, social scientists)—that of revealing underlying processes.

Although games increasingly include secondary interfaces that make them more editable and modifiable, ranging from player customization of graphics and sound to building new levels, the Kali process exemplified a desire among users to act not only as *content* providers for a game engine, but as *context* providers who can rearticulate the uses of the engine. This is an important distinction that raises questions about the larger computing environment in which games operate and about the freedoms that users can excercise within that environment. Changing the communications infrastructure used by gamers, as Cotton and Coleman did, is contextual in that it changes the forms of sociability through which the game is played. By the late 1990s, as Internet gaming began to take off, commercial game companies increasingly saw control over contextual issues as part of their business models. When, several years later, two programmers undertook a similar programming intervention in the context of battle.net, Blizzard Entertainment's online game space, they found the scope of their freedoms much more constrained.

bnetd vs. blizzard entertainment

Blizzard Entertainment is a successful game development company and publisher located in a corporate research park adjacent to the University of California, Irvine. Founded in 1991 (as Silicon and Synapse), Blizzard shipped its breakthrough hit, *WarCraft,* in 1994. Since *WarCraft,* Blizzard has had a succession of best-selling titles, including *WarCraft II* (1995), *Diablo* (1996), *StarCraft* (1998), *Diablo II* (2000), *WarCraft III* (2003), and most recently its

hugely popular MMOG game *World of Warcraft* (2004). Like many game industry startups, Blizzard passed through several corporate buyouts, ending up as one of the early (1998) media acquisitions of Vivendi Universal, a wide-ranging global media conglomerate. This trajectory was a common one in the electronic game industry in the 1990s, and it maps closely onto the growth of games into the dominant global entertainment media. It also provides a context for the shift in attitudes toward interoperability and other questions of network infrastructure in the course of Blizzard's releases.

For *WarCraft II* and other early games, Blizzard used Kali as its default software for Internet play. It even packaged Kali with its games (Miller, 2002). With the 1998 release of battle.net, Blizzard tried to internalize and centralize the social networking and hosting features enabled by Kali. Battle.net provided an arena for Blizzard customers to chat, challenge opponents, and initiate multiplayer games at no cost to the user beyond the purchase price of the games. According to Blizzard, controlling the portal through which its software titles were played allowed them to do better evaluation of product usage. Arguably more important from a business standpoint, it allowed them to authenticate players using a key method, making it less likely that owners of pirated copies could take advantage of the added value of online play.

In 1998, University of California, San Diego, student Mark Baysinger identified the protocol that the *StarCraft* clients used to connect to battle.net—by most accounts a fairly modest feat. In April Baysinger posted the first version of Starhack, a chat service for *StarCraft* players on battle.net. When Baysinger turned his attention to other projects, he reissued Starhack under the free software general public license (GPL). Other programmers and Blizzard game afficionados soon picked up the project. As Blizzard released new games, Starhack grew into a general battle.net emulator and was eventually rechristened "bnetd." At its peak, bnetd had 10 listed developers (Miller, 2002). Two of them, Ross Combs and Rob Crittenden, became the bnetd lead developers. A third, Tim Jung, became bnetd's Internet service provider and systems administrator.

Like tens of thousands of others, Combs and Crittenden liked to play Blizzard games on battle.net, but it was notoriously buggy and often slow and frequently crashed due to player volume. It also suffered from a number of "social malfunctions"—notably, wide latitude for players who enjoyed killing other players, and a series of well-known hacks that conferred unfair

advantages in the games. This made the game play experience frustrating for many newcomers and experienced players.

The mature bnetd performed all the functions of battle.net, but it opened them up to the players themselves. Players could download the open source software, install it, modify it if they wished, and run their own bnetd servers for playing Blizzard games (or potentially any number of other games). Combs and Crittenden argued that the motive was to facilitate fun, bug-reduced gaming sessions within friendly communities that would be respectful of one another. With bnetd in wide circulation, gamers no longer had to use the official battle.net site to play Blizzard games. Groups could play *StarCraft* or *WarCraft* independently, using free, locally hosted copies of bnetd as the platform.

Bnetd did not copy battle.net's code; rather, it was a ground-up reinvention of the functions of battle.net. This is a common meaning of "reverse engineering" in software development. It reflects the fact that commercial software vendors sell only the compiled code for their products—the ones and zeros read by computers—not the source code written (and readable) by humans. It further reflects the copyright protection afforded software, which protects code as if it were an original piece of writing, but does not cover its functions. Reverse engineering, in this context, requires close observation of the functions of a piece of software and the creation of a new program that can duplicate them.

The basic method for creating bnetd involved "packet sniffing" and "interception." Packets are the fundamental units of information carriage in modern communication networks. A packet consists of a *header,* which contains the information needed to get the packet from the source to the destination, and a *data area,* which contains the information provided by the creator of the packet. In its simplest form, a packet sniffer captures the data packets that pass through a given network interface. Once sniffed, the information contained within the packet can be analyzed and the software functions that produced it inferred. Bnetd identified these packets and built new, analogous functionality around them.

Although Baysinger had been threatened with cease and desist letters as early as 1998, no action was taken. This changed with the impending release of *WarCraft III* in 2002. Vivendi and Blizzard issued a new cease and desist letter and brought suit against bnetd developers for a series of violations: of the copyright on the software, of the license on the purchase

of software (the end-user licensing agreement, or EULA), and finally of the so-called "anticircumvention" clause of the Digital Millenium Copyright Act (DMCA). Of these, the last two invoked new, largely untested, and potentially far-reaching legal protections afforded software vendors. The EULA issue involved a test of the limits of the rarely read click-through software licenses that accompany most software. Could, for example, a EULA expressly forbid reverse engineering, as the Blizzard license appeared to do? The anticircumvention issue concerned an originally obscure clause in the DMCA that criminalized any attempt to circumvent the technological measures used to restrict access to copyrighted digital works, such as encryption or registration on a central server. The clause targeted practices that were common in many programming settings, ranging from encryption research, to forms of reverse engineering, to personal practices of archiving and backup. The latitude to create software that bridged proprietary systems—thus ensuring interoperability—was, in theory, severely curtailed by the new law. The anticircumvention clause went well beyond a simple additional protection for copyrighted work; it potentially broke the wide range of "fair use" exceptions to copyright for digital media (see Karaganis, Chapter 16 in this volume on modalities of control; see also Firooznia, 2000).

Blizzard won its case on both the EULA and anticircumvention issues in 2004 and again on appeal in September 2005. The consequences of the decision are worrying but far from clear. If interpreted broadly, it may enable any company to create a gated monopoly on network communications, bringing the interoperability of the Internet to an end (Wen, 2002).

majestic

It is a widespread article of faith in the software and computing fields that the future belongs to "ubiquitous computing," a vision of networked computers embedded in a vast array of devices and appliances. As in the past, game design is likely to pioneer this development. Already, network games are extending into heterogeneous computing environments that combine cell phones, PDAs, desktop and WIFI mobile computers, handheld game devices, and game consoles into continuous and contiguous multiplayer game experiences.

A fundamental challenge in the transition to heterogeneous networked gaming is how to synchronously communicate or represent the actions of players to each other in an effort to ensure that everything

happens at the same time on all systems, regardless of network latency or differences in machine speed. Such synchronization is crucial to creating a consensually coherent reality. Other important pieces of the puzzle involve developing compelling strategies for taking advantage of pervasive technologies like phone, fax, email, and the Web as part of the overall game environment in ways that make use of the "native" capabilities of the devices. It also involves thinking about how to design compelling social interaction through that multiplicity of devices, how to open up authorial control to allow players to have more open-ended and flexible play spaces, how to allow players to modify those play spaces within an existing domain, and how to provide customizable services that enable them to build new play spaces when desired.

Arguably, the most compelling comercially released network-centric game to date was *Majestic,* released by Electronic Arts in summer of 2001. *Majestic*'s marketing hook was that "the game played you." Conceived as an episodic web-based adventure, players created accounts, logged in, downloaded the custom-built application to run the first installment for free, and then were charged for subsequent installments if they chose to continue the game. In terms of narrative, *Majestic* was framed as an *X-Files*–style government conspiracy and cover-up, delivering its plot twists through a variety of interfaces and client devices.

The innovative conceptual move made by the designers was to have the game take advantage of everyday communication technologies like the Internet, phones, email, instant messaging, and fax. *Majestic* sought to create a narrative experience that blurred the line between lived space and game space. Upon registering, players were able to set the parameters of in-game communication. Depending on these choices, players could be contacted at any point during the day or night by game operatives who would either give them vital pieces of information to aid in moving them to the next stage in the drama, or provide them with misinformation in an effort to send them off track. Part of the developer's goal was to have *Majestic*'s episodic structure appeal to an older generation of gamers who did not have time to sit in front of their computers for hours on end, but wanted to periodically drop in and spend an hour or so to try and decipher a clue or see who had been attempting to contact them.

The result was a costly and high-profile failure. Despite well-financed advertising buzz, the pervasive dimension of the game was very poorly received from the outset: Of 800,000 initial registrants for the free first

installment, only 72,000 completed the process. Only 10,000–15,000 paid for the next installment. Overall, Electronic Arts lost an estimated $5 to 7 million (Morris, 2003).

Several reasons were offered for *Majestic*'s failure. One claim circulated in the gaming community (in part by Electronic Arts) was that the subject matter of the game became too controversial after the World Trade Center bombings. The broader cultural hiatus on sinister portrayals of government in the wake of the attack lends some credibility to this claim. *Majestic*'s terrorism themes resulted in the temporary suspension of the game after 9/11. I would argue that another part of the "failed" *Majestic* story had to do with the company's anxiety over what might happen if players had too little control over the technological interfaces to the game. Several news stories in the gaming press postulated the consequences of family members answering phones or receiving faxes from unsavory characters claiming that their loved ones' lives were at stake. This anxiety resulted in the developers' requiring players to grant "access rights" upon registration, effectively destroying the potential "surprise factor" of the game. This also prevented the game makers from pushing more aggressively at the lived space–game space boundary. Hindered by endless disclaimers and legal protections, *Majestic* became "too safe" to realize its full potential.

Although monumental in scope, according to the game's developer, Neil Young, *Majestic*'s ambitions were not particularly complex from a technical standpoint.[3] Not surprisingly, implementation became costly and difficult because of the proprietary issues and third-party companies that stood in the way of integration. Voice-over IP, instant messaging, and faxes all had to be worked out with service and technology providers. Negotiating such partnerships was no small task, and required considerable time and financial investment—reportedly in the neighborhood of $10 million and several years in planning and implementation.

The resulting "experience server," as the developers called it, was the closest example to date of a massively distributed, pervasive, multimodal gaming environment. The story of *Majestic* provides a clear and still very relevant indicator of the difficulties facing large-scale integration of social and gaming environments across heterogeneous and often proprietary communication networks. *Majestic* did not get far enough to run into player-driven questions about customization, modification, or fundamental retooling of the game environment. Rather, its failure illustrates the extent to which such

ambitions require either much larger corporate synergies than Electronic Arts could dispose of (despite numerous partnerships with AOL, Microsoft, and other media giants), or a much more open network architecture. With the DMCA providing legal leverage for a network model organized into proprietary silos, the odds of successful future developments in this direction lie heavily with the media giants.

unexceptional.net

Games are already the number-one downloaded application on mobile devices, representing upward of 90% of total download requests. According to Datamonitor analysts, in 2005 more than 200 million people in the United States and Western Europe—80% of all wireless phone users—will play online games using wireless devices. Four of the major mobile phone manufactures—Nokia, Siemens, Ericsson, and Motorola—recently established the Mobile Games Interoperability Forum (now consolidated into the Open Mobile Alliance, or OMA), which aims to define open standards that will let developers create and deploy games across multiple game servers and wireless networks for a variety of mobile devices. The creation of the forum signals an understanding that, in a field as immature as mobile gaming, proprietary standards are more likely to lead to costly balkanization and underdevelopment across the sector than to profitable monopoly positions. The sector is served when all actors participate in the creation of tools (Wrolstad, 2001).

The OMA represents a major positive step toward interoperability in one significant and growing portion of the industry. Unfortunately, the competitive landscape in other sectors leads to other calculations, often by the same corporate actors. The leading game console makers each have proprietary development suites and protocols, as do personal computer manufacturers, handheld device manufacturers, non-OMA mobile phone makers, and so on. Most are jockeying for dominant positions in the delivery of digital media. At the moment, however, the only thing the expanding multitude of devices will share is the need for an IP address. The kind of seamless interoperability between devices described above is not likely to emerge from within this competitive corporate climate anytime soon. It is for this reason that academia may be able to play an important role.

"Anywhere, anytime access" is the mantra of Cal-(IT)2, the recently established California Institute for Telecommunications and Information Technology[4]—an initiative between University of California, San Diego

(UCSD), and University of California, Irvine (UCI), dedicated to pushing the technical and social boundaries of IT development. The Game Culture and Technology Lab, which I founded in 1999 at UCI, brings together an interdisciplinary community interested in using game metaphors, design principles, and technologies to develop next-generation multiuser environments for artistic exploration, scientific visualization, and informal science education. As an institutional experiment, the Game Lab is itself an effort to ground the synthesis of perspectives necessary to bridging heterogeneous contents and contexts, both social and technological. A core premise of the lab is that appropriation, misuse, and hacking of technologies are not only legitimate forms of research and development but also can prove central to the process of innovation.

A project that has occupied much of my time lately is "unexceptional.net," an effort to build an arts-driven game space that can operate across a range of client devices. Unexceptional.net is a mystical-realist journey catalyzed by a series of interconnected events related to sexual infidelity, political conspiracy, and spiritual transformation. The project draws on the traditions of comics, graphic novels, and computer games in order to create an environment that crosses boundaries between pop culture, fine art, and social critique.

The central character of unexceptional.net is "Guy," a frustrated comic artist, game designer, and hacker who has recently found out that his long-time partner is having an affair. This discovery launches him on a series of quests to gain insight into the nature of his partner's relationship. Guy's experience is infused with a disturbingly co-opted and corrupted Eastern philosophy and spirituality that dictates the nature of the quests, and of the ultimate goal, his search for "enlightenment." To achieve enlightenment you must follow Guy on a series of web- and GPS-based quests to find special key objects that will help unlock and open all seven of his major chakras, the energetic centers of the body according to Buddhist doctrine.

The project involves an extensive database infrastructure for storing and delivering game-state data via the Web, GPS-enabled mobile phones, and a 3-D game client. A blog is used to give the player information about the current game state, player locations, and quest progress. The blog also provides access to an administrative framework enabling game designers to alter the game and have it immediately reflected in the various game clients through a series of user-friendly web pages.

One of the key innovations of unexceptional.net is the way we procedurally generate the game world on the phone. All terrain and structure data used in the game is location specific and sent to the phone from the game server during game play. The game world thus aesthetically represents the physical environment in which it is played. If one is in the desert, one sees an abstracted representation of the desert; if one is in the middle of the ocean, one sees water; and if one is in a city, one sees urban space. This makes the game world extremely extensible, since the small memory footprint and screen size of the phone are no longer a liability in terms of more complex and emergent game play.

In addition to using the screen of the phone to display the game, we also allow players to use their voices to advance quests.[5] This allows players to receive calls based on where they are in physical space, so that they can continue quests in "voice mode," better using the native capabilities of the device. Finally, we have incorporated a 3-D client into unexceptional.net using the Torque Game Engine. The initial goal is to make the 3-D client mirror how the GPS phone client works. In other words, we algorithmically generate the 3-D game world and allow content creation and modification to a far greater degree than is currently common in networked 3-D gaming environments.

As game play ensues, the game state is continually fed to the server via the different client interfaces and broadcast back out to those interfaces. If, while playing the mobile phone game, the player logs back in to the blog, the impact of game play via the phone will be reflected. As the player continues to do things via the blog, the phone and the 3-D clients will be affected. These are just several of the innovative methods we have been able to explore by using a combination of free or cheaply available software while exploiting the network protocols that support this type of interoperability. A main goal of unexeceptional.net is to push at these boundaries and develop capabilities that can be made freely available to people for their own creative experimentation.

In summary, key objectives of the project include: (1) using unexceptional.net as a test bed for deploying custom-designed and freely distributed software that takes advantage of everyday communication technologies such as blogging, email, 3D gaming, and mobile telephony in order to enable anywhere, anytime access to heterogenous game worlds; (2) implementing the game infrastructure in such a way that it can be used for alter-

native content development and deployment; (3) facilitating ease of content creation through provision of web-based tools for game modding (using commercial game products to create custom levels in existing titles); (4) sharing the results in the public domain through Internet distribution, formal exhibition in fine-art contexts, professional conferences and events, and publication; and (5) exploring novel forms of individual and community interaction.

in closing

Despite the concentration of ownership associated with Vivendi-like corporate media structures, the current network milieu is still primarily one of fragmentation and divergence, characterized by a proliferation of devices connected through discrete networks. This contrasts with most accounts, which envision devices interacting with one another through a single network infrastructure. Such an infrastructure, or "engine," would enable social actors to participate in the same online world from whatever device they chose, while maintaining persistent identities and accounts. It would allow them to carry their personas, assets, and social networks between platforms, to scale media in sensible ways, and to have anywhere, anytime access to their shared communities of interest. Mizuko Ito (Chapter 6, this volume), danah boyd (Chapter 8, this volume), and Shay David (Chapter 11, this volume) have all explored aspects of this ambition in their contributions. Ensuring that such an infrastructure remains open and customizable would be a giant step forward in putting both content and context back into the hands of a more diverse, eclectic, and potentially innovative population of players.

There are different levels at which creative work happens. With respect to net-art practices, for example, an important distinction can be made between work that is made using available tools and technologies (e.g., precoded software applications such as image, sound, and video editors, word processors, 3D modeling programs, and the like), and work that is made by retooling the tools, or by changing the infrastructure that the tools run on (like custom-coded web browsers, image processors, sound generators, etc.). This is another way of approaching the distinction between *content* and *context* creation. In the first case, artists and designers provide content for and work with existing infrastructure; in the second, they rework infrastructure in the interest of creating alternative contexts for interaction and experience. There is no clear line between the two modes of practices, and we are not well served intellectually by drawing them. I would argue that we are better

served the more we facilitate that crossover and the less we let that capacity be determined by the size and scope of commercial actors. The range of newly empowered synthetic cultural and technological practices—hacking, cracking, poaching, sampling, mixing, appropriating, misusing, reverse engineering, and others—all partake of and depend on this open dynamic.

With regard to game engines, this means exposing the tools of creation so that they also can become a primary place of play. Practices like modding and machinima (using 3-D game engines as real-time movie-making platforms) signal ways in which gaming has taken important steps in this direction. We have much more social and technical work to do to understand how to promote those strategies in a distributed networking environment. We have much more political work to do to ensure that those technical potentials can both empower users and be widely enjoyed.

In an interesting and timely article from 2000, author and game developer Crosbie Fitch playfully made a pitch for a new protocol (used loosely) that he terms the distributed Internet operating system, or DIOS. From Fitch's perspective, DIOS will facilitate the equitable pooling and exploitation of all information resources around the world. According to Fitch, the most suitable candidates for a DIOS are MMOGs and the engines that support them. The ones that survive, he argues, will be scalable, distributed systems that solve the issues of synchronous presence, diversity of devices, and capacities for expressive behavior. He argues that these goals are much more proximate to the entertainment industry than to financial, military, or other industries. For Fitch, this makes MMOGs not only the future of games or the primary form of entertainment for this century but also the future of the Internet itself (Fitch, 2000). In a nutshell, this is what we believe in the Game Culture and Technology Lab as well, and what, in our own small way, we are collectively working toward.

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notes

1 Formerly the Interactive Digital Software Association (IDSA).

2 Also referred to as MMORPGs (massively multiplayer online role-playing games).

3 When I spoke with Young (a vice president at Electronic Arts and general manager at Maxis) in late Fall of 2003, he was reluctant to even talk about the game, apparently viewing it as a failed project, at least commercially. He was far more eager to discuss the recent *Return of the King* title he had just produced. The entire floor at Electronic Arts was filled with materials associated with the Tolkien saga—life-size characters, wall maps of Middle Earth, architectural models, figurines, and so on. Our conversation died fairly quickly and after I said I believed history would prove *Majestic* a far more significant contribution to game culture and technology than any of the *Lord of the Rings* titles.

4 One of four recently established California Institutes for Science and Innovation, and the product of a partnership between the University of California, San Diego, and the University of California, Irvine, campuses.

5 This has been done by integrating a freely available telephony software called Asterisk, which incorporates automated call routing. We have hooked a speech-to-text and text-to-speech system called Sphinx (developed at Carnegie-Mellon University) into Asterisk.

13

The *Diablo* Pogrom

Doug Thomas

As danah boyd's contribution (Chapter 8, this volume) illustrates, software modifications are not the only way to change the context of a game engine. The context of the game is shaped by the diverse intentions of the players, not merely by the stated rules. On June 28, 2000, Blizzard Entertainment released *Diablo II*, a follow-up to their enormously popular 1997 game, *Diablo*. By July 17, *Diablo II* had sold more than one million copies, making it the fastest selling video game in PC history.[1] Within six months *Diablo II* had sold more than two million copies and had been named Game of the Year by a host of gaming magazines and websites, marking it as one of the most successful PC games of all time. *Diablo II*'s popularity was partly driven by Blizzard's free online gaming network, battle.net, which allowed anyone who purchased the game to play in an interactive multiuser environment. Battle.net, in turn, was divided into "realms," reflecting a "real-world" geography of servers and bandwidth. There were two U.S. realms (U.S. East and U.S. West), and separate realms for Europe and Asia. Blizzard assumed that the players would self-assign to their regional servers in order to take advantage of higher bandwidth.

Like many online multiplayer games, *Diablo II* created its own economic system. Players traded valuable items, exchanged gold and loot, and even innovated a system of currency built around a game item called the Stone of Jordan. The "realms" kept each system closed and independent, meaning that players could not trade between realms or play with or against players on other servers. Over time, this created a player imbalance that greatly favored U.S. West. U.S. West, which became known as the premier *Diablo II* realm, home to the best and "richest" players.

As the game grew in international popularity, players from all over the world converged on the U.S. West server, leading to frequent overloading and lag in game play. The problem became particularly acute when *Diablo II* was released in Korea. Within a few weeks of its release, *Diablo II* sold 300,000 copies, making it far and away Blizzard's most profitable overseas launch. This rapid uptake produced a massive influx of game players into U.S. West, causing further problems with game lag. Whereas in earlier instances, the causes of lag were invisible and consequently were attributed to the community at large, the new round of slowdowns had a visible scapegoat. The Korean version of *Diablo II* included linguistic customization that facilitated game play among Koreans, but which marked Korean players within the game space. As problems with lag worsened, a portion of the player base began to blame the Korean players. Language barriers in the shared game world added to tensions. Players in the

United States began to think of the fictional game world as a nation-space, with an accompanying sense of entitlement to the U.S. West server domain.

This entitlement rapidly took on an ugly aspect. U.S. Players in the United States began a campaign against Korean players, both inside the game space and outside on websites and forums. They used tropes of national borders and boundaries, and framed Korean players as "illegal immigrants" and "invaders." Players began joining games with Korean players with the sole intention of disrupting game play and literally chasing them off of the servers. Some players adopted racist or anti-Korean names. At one point a bug was discovered that allowed players to send a string of characters to the screen that would crash the Korean version of the game (a simple line of 255 periods). It became common to see players enter a game and send the string to the screen to clear the game of Korean players.

Perhaps most alarming was the creation of KPK, Inc., or Korean Player Killers, Incorporated, a self-described "*Diablo II* Community Effort."[2] The site blamed Koreans for server instability, excessively long wait times to join games, international video piracy, creating a sense of "excessive paranoia," and filling chat rooms with "nonsense and numbers." Korean players, they argued, sought to disrupt their enjoyment of the game: "It is also all too common for a normal, peaceful, public chatroom to be instantly filled with meaningless dribble by Koreans who desire only to piss off the Western realm users," wrote one user.

Blizzard worked to end the problem by correcting the player-killer bug, the visible differentiation Korean players, and—most importantly, in the end—the capacity problems responsible for lag on U.S. West. The anti-Korean player "movement" lost its grounding in the system archicture.

Although it is hard to take the *Diablo* pogrom completely seriously as a performance of national and racial identity, it is interesting to consider where the differences from more familiar forms of violent nationalism lay. In the *Diablo* case, xenophobia and racism were mapped onto an unusual representation of space and territory, but one that is in some respects no more "imaginary" than the experience of the nation itself. The strangeness of the circumstances in U.S. West bring out the formal character of national adhesion—the requirement of an identity principle that can define the in-group ("people of like backgrounds tend to stick together, and in these games the situation is no different"), despite the manifest difficulty in this case of knowing who one's compatriots were. The overblown performance of national identity in *Diablo* is testimony to the portability of the race–nation discourse and to the ease with

which it is activated. It should come as no surprise that it can be asserted in virtual spaces, or that investments in virtual lives should give rise to strong senses of injury. At the same time, the exaggeration is suggestive of the ways in which the pogrom itself came to resemble a game within the game—with rules, a narrative, forms of action, and venues for community commentary and reinforcement. Such games within the game develop because players ultimately determine the meaning of the game and contextualize the game space, no matter how strictly the game is scripted. If this overflow of meaning is responsible for the growth of new roles and forms of cultural engagement in online environments—of playful interventions—it should come as no surprise that it also produces playful hatreds.

notes

1 Sales figures are quoted from PC Data, the industry standard for monitoring and tracking PC games sales figures (http://www.bluesnews.com/cgi-bin/articles.pl?show=44).

2 All references to the KPK are from http://www.kpk.250x.com, accessed June 2, 2004.

14 Disciplining Markets in the Digital Age

Joe Karaganis

We are embarking on a new project—technological research. We aim to enlist the finest brains of the best in the high-technology field to develop technological measures and means to baffle piracy. At the same time we are continuing to work with the most inventive men and women in the IT and CE [consumer electronics] sectors. By embracing these innovative scientists, I believe we can extract from this research more than a few counter-measures to put together a technological framework where all our industries can thrive, to the benefit of consumers. We are hopeful, very hopeful. —Valenti (2003)

Much of this volume explores how digital technologies support forms of creativity at the peripheries of commercial systems of cultural production in the position of the cultural value chain traditionally assigned to consumers. Mizuko Ito (Chapter 6), T. L. Taylor (Chapter 7), Jonah Peretti (Chapter 9), and Robert F. Nideffer (Chapter 12), especially, examine shifts in the technologies and norms that structure relationships between cultural producers and consumers and give rise to new cultural roles that blur distinctions between the two—the player–producer, the *otaku,* the contagious media agent, the hacker. The contribution of digital technologies to this process is felt primarily along two axes: growth in the scope of "authorship," meaning the ability to create and transform cultural goods; and growth in the size of the publics within which individuals can efficiently operate, reflecting improved capacities to search for, collaborate on, and distribute expressive material across large networks. Decreasing computing costs and increasing computational power—the familiar effects of "Moore's law"—have driven the first process. Developments in network technologies have underwritten the second, here tracking not Moore but rather Robert Metcalfe's intuition that the value of networks scales exponentially with the number of participants ("Metcalfe's law").

As these nominal laws reinforce each other, individual expression can circulate and aggregate on a scale once reserved for corporations and other large institutions. This empowerment of the periphery is a recurrent feature of the recent history of digital technologies, reflected in practices as diverse as open source software production, music remixing, and peer-to-peer file sharing. It is a social dynamic anchored in and, in many respects, epitomized by two key technologies: the decentralized, "end-to-end" architecture of the Internet and the general-purpose computer, which together have provided wide latitude for user-centered innovation. In many respects, this openness is a fragile construct built on research cultures, design practices, public policy

choices, and market forces that have—at key moments—undercut the ability of industry leaders to control innovation. There is nothing permanent or necessary about it.

Since the emergence of mass markets for books, newspapers, and other media products in the 19th century, a very different dynamic has shaped the production of most cultural goods. This dynamic favored a relatively sharp division of roles between large-scale producers and distributors on one side and consumers on the other. Even where individuals remained closely identified with the production of cultural works—writing fiction, for example—culture markets were accessible only through larger intermediaries, such as publishers. Today, production and distribution are dominated by media conglomerates built to leverage not only economies of scale in the production of goods but also economies of scope as they repurpose content across different media platforms and world regions. These advantages depend on control of the commodity chain—the life of the cultural good—from production, to distribution, to increasingly complex and persistent relationships with consumers. Historically, this kind of control was achieved not through research projects like the one Valenti describes, but by long processes of accommodation between media industries, individual creators, consumers, and the material characteristics of the media themselves.

As cultural commodities are digitized, the characteristics that matter most are the generic features of computers and the Internet. At their simplest, computers are devices for storing, moving, copying, and transforming data. All higher functions build on these operations. The Internet's central innovation, in turn, was the ability to connect remote computers without the need for centralized intermediaries. In little more than a decade, these conjoined technologies radically democratized the production and distribution of media. In the process, they have challenged important aspects of the industrial organization of culture. Distribution, once subject to powerful economies of scale, has become cheap and easy, and difficult to monopolize. This proliferation of capacities has partially unraveled industry commodity chains, without (yet) creating a new culture sector that can assert its interests against the incumbents. From the perspective of the industries, these developments look more like the disintegration of culture—their culture—than like cultural democratization.

cultural futures

Concern for the future of emerging user-centered dynamics underlies our inquiry into the "structures of participation" of digital culture. One of the core political commitments of this volume is to an expanded view of cultural agency that embraces the new capacities for making and sharing creative work. In a broad sense, these capacities are basic to all cultural activity, reflecting the complex ways in which people create and share meaning. Digital technologies do not alter these fundamentals, but they do offer new ways of scaling up cultural agency from interpersonal and local relations toward the larger, dispersed forms of association characteristic of modern society. They create the conditions for a shift in the organization of culture, away from the exclusive reliance on culture industries to manage these transitions of scale. Digital technologies do not "disintermediate" the distance between individuals and larger publics, but they have enabled alternatives to some of the existing forms of mediation—especially those related to finding, collaborating in, and disseminating knowledge and cultural goods. For publishers, broadcasters, record companies, film studios, and other cultural intermediaries, this is often a threatening process. Digital technologies have done more than just encroach on the productive roles once reserved for large-scale enterprises; they have broken open the carefully disciplined networks of distribution and promotion that make cultural goods available and visible in crowded media environments. Many of the current struggles over the use and regulation of digital technologies reflect the efforts of cultural intermediaries to reassert and extend these traditional roles.

The convergence of digital technologies evokes broad and, in many respects, competing visions of the digital future. It raises a multitude of questions about the technologies and laws that structure how people participate in and share their digitally mediated culture. This chapter examines the structure of participation that links culture industries to consumers, focusing on industry efforts to discipline that relationship through the control of new technologies. In Chapter 16, "The Ecology of Control," I look more explicitly at shifts in the technological infrastructure and competitive landscape that underlie culture industry visions of secure digital delivery, from filtering technologies to digital rights management (DRM) to the emerging general architecture of trusted computing (TC).

culture industries

Although the technology sector often gets the most attention in accounts of recent economic and social change (Castells, 2000; Rifkin, 2001), the content or copyright sector has also experienced prodigious growth and consolidation over the past three decades.[1] In the United States the copyright industries have grown at more than double the rate of the general economy, adding—by industry accounts—roughly $800 billion to the GDP in 2002, and approaching $100 billion per year in foreign sales (Siwek, 2002, 2006). Corporate consolidation, driven by the globalization of culture markets and by promised economies of scale and scope, has produced a sector dominated by interconnected oligopolies. In the United States, four firms sell 90% of recorded music, six account for 90% of film revenues, two dominate radio, five (and shrinking) own the cable TV market, four dominate cell phone services, and so on (Garnham, 2000; McChesney, 2004). Many of these separate markets are dominated by the same vertically and horizontally integrated giants—especially Sony, Viacom, Bertelsmann, News Corp, and General Electric.

Until recently, copyright industry growth had little connection to the growth of the Internet and personal computing. With the notable exception of software, which gained copyright protection in 1975, the copyright and information technology (IT) sectors followed different and, in important respects, incompatible paths of innovation. The IT sector privileged relatively open technical architectures that, over time, facilitated the transformation of the architectures themselves. The personal computer, in particular, grew out of a tradition of general-purpose computing that viewed computers as universal machines, capable of emulating any process. As computers became commoditized in the 1980s, advances in core technologies—microprocessors, storage, and memory, especially—became the primary market differentiators.

The culture industries, in contrast, have traditionally profited from innovation within stable *content formats,* delivered through relatively secure technological channels. These channels include the distribution of goods in the usual sense, but more broadly refer to business models that structure the sale and circulation of commodities in ways that prevent widespread secondary distribution, which would undermine primary markets for the goods. Ticketed exhibition (movies), bricks-and-mortar retail for material goods (books, CDs), broadcast to home devices (radio and television), and subscription services (magazines, cable TV) are all commodity systems that

successfully meet the condition of controlling access to content. The substantial cost of these infrastructures is recouped by selling variation within the format—the continuous turnover of new books, movies, record albums, and programming. Demand, for its part, is driven not by differences in capabilities (this year's bestselling paperback is no more capable than last year's) but by differences in the content and style of the individual works and by the interplay of those qualities with marketing efforts, genre conventions, and audiences.

All such business models require "metered access"—the capacity to deliver content on restricted terms. This condition derives from the peculiar characteristics of cultural goods. Since the rise of industrial-scale cultural production, cultural goods have been characterized by high costs of first production (writing a book or making a movie is costly), but comparatively low costs for every subsequent copy produced—low *marginal cost of production*. Under these conditions, producers need widespread distribution systems that can recoup initial investments and control mechanisms that can ensure that goods remain "excludable"—capable of being denied to others—as they circulate (Delong and Froomkin, 2000; Odlyzko, 2001).

Excludability has traditionally been defined by two factors: law, especially copyright law, which accords owners a temporary monopoly on distribution; and, at a more basic level, the material characteristics of the media themselves that make the copying, redistribution, or exhibition of content costly or inconvenient. Whereas the legal remedies afforded by copyright provided an effective tool for regulating industrial competition, the control of consumers depended heavily on the materiality of media, which made infringement cumbersome. Other forms of excludability followed from the natural scarcity of certain kinds of distribution channels, such as television and radio spectrum. These overlapping legal and material barriers allowed the copyright industries to maintain an approximation of excludability for goods that might otherwise circulate at low marginal cost.

Where copyright infringement occurred, it was likely to be on an industrial scale, analogous to the production of counterfeit goods. Even in the early 1990s, copy culture still followed the rules of industrial production, split between illicit mass producers with elaborate black-market distribution channels (operating freely in many countries but in only limited ways in the United States) and craft practices confined mostly to individuals and small groups. Individual music sharing, for example, was still predominantly

grounded in analog cassette recording, made one at a time and passed along a low-bandwidth, high-latency "sneaker net" (a reference to the transactions among teenagers that typified the network).[2] Videocassette recording, photocopying, and software piracy operated within similarly split-level economies. Scale and commercial impact were usually the factors that determined exposure to the law: Large-scale copiers were plausible competitors to existing copyright holders; small-scale copiers, such as teenagers copying audiotapes, were arguably more limited in their potential commercial impact, and certainly more costly to trace and discourage.[3]

De facto freedoms to use, share, and circulate cultural goods were thus shaped by the costs associated with their control. Individuals could do little to compete with industrial-scale reproduction and distribution; by the same token, copyright holders could do little to police use below certain levels of social organization. The resulting zone of uncontrolled, noncommercial use had obvious social utility and gradually developed justifying political rationales. Tolerance for these secondary forms of distribution and use, especially in educational contexts, found a home within traditions of republican political thought that viewed the circulation of information and ideas as a positive social good—indeed, as a prerequisite of democratic culture. These claims were eventually formalized in fair-use and fair-dealing doctrines within copyright law. They found a home, too, in the development strategies of poorer nations that, as net importers of copyrighted materials, had incentives to maximize the flow of cultural goods at minimum cost. This was the case, notably, of the United States in the 19th century, which built its domestic publishing industry on the rejection of foreign copyright (Ben-Atar, 2004; Vaidhyanathan, 2001).

Since the British Statute of Anne (1709) first accorded rights to publishers rather than authors, copyright has favored an industrial cultural model that privileged scale of production and the control of the sale. The arrangement worked in part because neither could be fully or efficiently achieved. It left room for diverse political goals and public rights to be mapped onto the technological and economic realities of the media economy. These limitations underlie what Lawrence Lessig (2001) and other legal scholars have described as the historic balance of American intellectual property law, with its constitutionally mandated concern for the public good.[4] This balance always involved delivery channels that "leaked" at the edges of their respective markets, creating zones of hard-to-regulate use. In the United States, this

leakiness was embraced and codified in the concepts of "fair use" exceptions to copyright, which favored contemporary cultural and political commentary, and limited terms, which supported a relatively unencumbered dialogue with the past—the first U.S. copyright term was only 14 years, renewable once (since then, the term has expanded to the life of the author plus 70 years, or 95 years for corporate works). Although the balance between public and private purposes gradually shifted over time, the durability of the paradigm allowed institutions to emerge within certain technological and social niches that served public purposes, such as U.S. public libraries with their open circulation policies. As Jürgen Habermas and other historians of the public sphere have observed, liberal polities were the products of these conditions of public dialogue—of the circulation and use within society of information *about* society, outside the control of either the state or powerful private actors.

piracy and control

As file sharing systems began to efficiently connect the media libraries of personal computer users in the late 1990s, the copyright industries hit the panic button. Industry associations for music (Recording Industry Association of America; RIAA), film (Motion Picture Association; MPA), and software (Business Software Alliance; BSA), as well as larger umbrella organizations like the International Intellectual Property Alliance (IIPA), invested heavily in public relations and lobbying campaigns to shape the terms of the larger debate about digital culture. Far from exploring the social role of leakiness in an open society, this campaign focused almost exclusively on piracy and its impact on creative professionals, framed by extravagant accounts of the imminent cultural "dark age" or "Armageddon" (Valenti, 2000) if stronger content controls were not written into law.[5]

For the industry groups, the analogy to material goods was and remains crucial: unauthorized use is synonymous with theft, unauthorized distribution with piracy, and the whole with social evils ranging from murder to drug abuse to terrorism.[6] Although surveys of vulnerable groups such as musicians revealed strong ambivalence toward file sharing (Rainie & Madden, 2004), RIAA testimonials by aggrieved musicians helped establish a backdrop of personal injury claims to corporate antipiracy efforts.

The role of file sharing and piracy in undermining structures of compensation for artists is a real concern, but also one that obscures the nature

of industry demands for a secure delivery channel. The copyright industries, in general, do an astonishingly poor job of compensating creativity. For the vast majority of authors, musicians, and other creative professionals, the prospects of significant returns from industry contracts are remote. As the musician Courtney Love (2000) noted in her widely read piece on fair practices and the music industry: "The 273,000 working musicians in America make about $30,000 a year. Only 15% of American Federation of Musicians members work steadily in music." Even successful musicians recoup only a tiny portion—in both real and percentile terms—of the revenue flows generated by popular work (Albini, 2002). For writers, the situation is typically worse: A 1981 report estimated average annual income at around $5,000. Although RIAA began to identify and sue file sharers in 2003, collecting on average $3,750 from settlements (as of February 2006, from 18,000 lawsuits, with 1,700 settlements by 2005), none of this money has returned to musicians, the allegedly injured parties.

RIAA can neglect to compensate musicians from the file sharing settlements because the suits are less a defense of fairness to artists than of a business model built around a certain kind of product and structure of compensation. Increasingly, that business model depends upon the production of "hits." The music, film, and publishing industries have all become hit-driven industries, with a correspondingly uneven distribution of profits, and corresponding risks when the hits fail to materialize. Of the 459 movies released in the United States in 2003, 4% generated 40% of industry revenues. Of the 175,000 books published in the United States in 2003, only a few hundred received the "big push" of advertising, book tours, and payouts for table and window space in stores; in the end, 5% of titles accounted for 80% of revenues. RIAA estimates that only 10% of major-label albums make money. For video games—an industry experiencing both rapid growth and consolidation—the figure is closer to 20% (Spector, 2005).

The hit system has become both a cause and an effect of industry gigantism. In a market of 175,000 new books per year, only large publishers can afford the costs associated with promoting a book to best-seller status. In a crowded commercial film space, only large studios can spend the *average* $40 million (in 2002) to ensure the commercial visibility of a movie in the U.S. market, or the $75 million spent to boost the blockbuster prospects of a film like *Spider-Man 2* (promotion for *Spider-Man 3* in 2007 is reported to be $150 million, on top of production costs of $350 million). Only large

companies can absorb the high rates of failure associated with such promotion, or deploy the integrated "media mixes" that extend and cross-promote products across different media and sites of consumption.[7] The proliferation of media sources such as on-demand movie services and the Internet has reinforced this pattern, making visibility and audience attention into expensive and unpredictable commodities.

This enormous investment in the visibility of media within a saturated media landscape is a symptom of industry uncertainty about the quality of its investments. Despite the growth of a costly science of marketing and audience tracking over the past three decades, there is no formula for success in the market for cultural goods. From the distributor's perspective, the mass audience for any particular good is a hypothesis constructed from highly fallible marketing techniques. Most industry bets prove to be bad ones. Marketing and market research, genre formulas, star systems, and the growth of media mixes and content franchises (with inevitable sequels and spinoffs) are the default strategies for pushing back against this uncertainty. The universal practice of these strategies, however, means that they confer no clear advantage, and simply raise the industry floor for costs of marketing and distribution.

This fragile structure of investment raises incentives for market concentration and the vertical integration of production and distribution. Both forms of consolidation dilute risk within a larger pool of bets and make it possible to amortize losses through global networks and across different media. The deregulation of media and communications industries in the 1980s and 1990s abetted this process, allowing—inter alia—the reemergence of vertical monopolies between studios and theater chains in the 1980s, and between television networks and production studios in the 1990s. Although such deregulation was almost always justified in terms of alleged superior efficiencies of scale in meeting consumer needs, it also reflected industry concern that size was the only antidote to the irrationality of their markets—to their inability to predict consumer taste or, consequently, returns on investment.

As market concentration ran its course in the 1990s and early 2000s, leaving a handful of companies in control of most areas of media production, other strategies for protecting corporate investment grew in importance. Stronger and more pervasive intellectual property laws became a more explicit industry priority, leading not just to longer copyright terms but to new proposals covering data, broadcasts, web transmissions, encryption

tools, and other moments in the life of the cultural commodity. Technological mandates (the broadcast flag, spyware, "trusted computing" measures) have been another focus of industry activism, with the common purpose of eliminating points of leakage in the commodity chain and strengthening contractual agreements with consumers. Such mandates are attractive because they circumvent the high cost of enforcing intellectual property rights through the traditional remedy of legal action.[8]

These strategies extend the cultural commodity chain in two key respects: they promote the control of goods through to final consumption, especially via the shift from sales models to technologically enforced licenses that can circumscribe use indefinitely; and they commodify much smaller increments of use, as digital technologies permit the *debundling* of different uses and features (Szabo, 1997). Taken together, these measures outline a concept of copyright different from that associated with the compensation of artists or, in the European context, the "moral rights" of authorship. In Drahos and Braithewaite's (2003) terms, this is the architecture of "financier's copyright," which "rests on the view that copyright must serve the financier of copyright works by guaranteeing rights of exploitation in whichever markets the financier chooses to operate" (p. 176).

alternative structures

The file sharing debate looks different when viewed from the perspective of financier's copyright and the hit structure of the industry. File sharing, in this context, is not a challenge to sales in general or to artists' livelihoods in particular—in fact, the current evidence for such harm is weak (Geist, 2005; Pollack, 2005; Pedersen, 2006). But it does put pressure on the top-heavy, promotion-driven investment structure of the major record labels, which like other hit-based industries rely on tight control of the commodity chain during their brief window of cost recovery. File sharing, in this context, undermines the ability of the industry to recapture its investment in shaping and priming the marketplace. It makes hit-making a riskier and more costly business.

Several recent studies (Oberholzer-Gee and Strumpf, 2007; Pedersen, 2006) have begun to document this hit-centered dynamic on file sharing networks—from the very rapid online dissemination of hits to a (posited) relative shift of revenues from wealthier to poorer artists. The growth of small independent labels, characterized by lower promotion budgets and better compensation models for artists, provides some evidence of organizational

adaptation to this changing environment. Whether the growth of independents will translate into a larger cost structure, value-added model, and reinvigorated fan culture for music that can compete with "free" distribution is an important question for the next few years.

Peer-to-peer (P2P) enthusiasts often point to a different virtue of file sharing networks, rooted in their more efficient searching and sampling of the "long tail" of media history (Anderson, 2004). Chris Anderson's "long tail" refers to the vast majority of cultural artifacts that fall outside the narrow promotional structure and short time horizons of industry hit making—film archives and music and publishing back catalogs. Much of this work is not just invisible in the commercial marketplace, but is also unavailable because of how promotion shapes distribution and stock. All but a few high-grossing and classic albums fall out of production within a year or two.

File sharing has been an unreliable but, to date, largely unmatched resource for connecting this record of cultural production to niche audiences. It has been effective both for older, out-of-production works and for areas of "amateur" production such as house music and techno, which have little or no formal distribution structure. As Jonah Peretti notes (Chapter 9, this volume), these informal and free channels of circulation have the capacity to magnify attention, leading to sudden, sometimes massive, freely distributed "hits" that industry channels do not efficiently capture. Apple's iTunes list of most-downloaded songs—one of the few ways of comparing standard and rogue hits—regularly reflects the products of these viral publicity networks (Dean, 2004).

In spite of file sharing's obvious potential for disrupting distribution channels, there is no clear evidence that it has diminished sales for music or other copyrighted goods. The past several years have been a period of volatile but sustained growth for most of the copyright industries: U.S. film industry revenues grew by 7% over the past six years (with a modest reversal in 2005); the often-lamented field of book publishing averaged 5% growth.

The music business is the major counterexample, having suffered declining CD sales since 2000 and a slow but steady erosion of the retail sector. The factors contributing to this decline are numerous and difficult to isolate, however. They include the 2001–2002 economic downturn (which also affected books and film); the growth of competitors for discretionary media spending, such as DVDs, video games, and cell phone services; the end of the elevated sales that accompanied the transition from vinyl to CD, as

consumers converted their collections; and the debundling of albums into digital singles, which has diminished the dominant unit of sale. In all likelihood, the poor management of talent by the majors must be included, as the hit structure distorted the feeder system for new artists.[9] The growth and relative health of the artist-friendly independent labels suggest that the latter should not be underestimated.

Market impact studies offer contrasting interpretations of how and why people use file sharing services. Some privilege the substitution effect with respect to CD purchases, in which file sharing represents lost sales; others emphasize its use in sampling music later purchased in stores. In six years since the initial round of studies surrounding the Napster case, this debate has not greatly advanced.[10]

It is safe to assume, however, that copy culture will thrive as long as it offers significant value over commercial markets—variously in terms of cost, ease, flexibility of use, or availability of material. In this calculation, the cost of file sharing to users is not zero: Managing downloads on P2P networks has traditionally been time consuming, unreliable, and occasionally dangerous (Steve Jobs of Apple once equated file sharing with working for the minimum wage). To date, however, there have been few industry attempts to compete on these terms. There has been little downward pressure on music prices (in distinction from DVDs, which are sold in a wider range of pricing tiers). Major label experiments with digital distribution models have been tentative and—until very recently—focused on creating tightly controlled subscription services that could circumvent Apple/iTunes. The most prominent example was the reformulated Napster, launched in 2003. It has had only modest uptake, with 500,000 subscribers in January 2006. Recently, the perception of crisis has generated interest in alternative approaches. Independent labels have gravitated around the more aggressive eMusic service, which both undercuts iTunes/majors pricing and dispenses with the DRM controls favored by the majors. In 2007, faltering major EMI agreed to distribute its catalog through iTunes without DRM encumbrances, signaling a possible wider retreat on the issue of control, if not on pricing.

These experiments are partial recognitions of the need to narrow the value gap between commercial and informal/illicit distribution, but they have not yet produced a stable business model. Without clear guideposts, the culture industries have made gestures in many directions—punishing file sharers in order to raise the perceived costs of copyright infringement; vacillating

on pricing arrangements for music download services; adding surveillance software to CDs; dropping DRM; developing new, more elaborate protection strategies; and in general working toward technical and legal mandates that can buttress their traditional business models. No coherent way forward has been articulated.

the new bargain

Technologies that lower the cost of production of existing content formats or that extend variation within them are a source of renewal for the culture industries: they enable the recycling of old content in new forms. The music industry's orchestrated transition from the long-playing record to the compact disc is a notable example: It maintained continuity with the album format and the retail distribution channel while offering enough new features to justify, for many consumers, the replacement of existing LP collections. Although this transition produced a massive sales boom in the 1990s, the digitally formatted, unencrypted CD standard laid the foundation for the consumer-driven digitization of music in the late 1990s.

Technologies that transform channels of distribution are harder to anticipate and assimilate, and often become occasions of conflict between old and new cultural intermediaries. Marshall McLuhan's (2001) dictum that "the content of a new medium is an old medium" suggests the basis of this conflict. Although McLuhan was speaking broadly of ways in which old media frame thinking about the uses of the new, his statement also encompasses the literal issues of content ownership that often dominate the early days of new media. This pattern has been reproduced many times: Radio broadcasting in the 1920s routinely made unauthorized use of recorded music; cable television in the 1960s and 1970s similarly retransmitted broadcast television programming. In the 1980s it was satellite television's turn with content taken from broadcast and cable sources. In the 1990s webcasting followed the same path. In each case, new distributors "pirated" the content of existing distributors, often taking advantage of ambiguities in copyright law regarding new technologies. In each case, conflict between distributors resulted in statutory compromises that permitted new distributors to access the content of old distributors for a set fee, via compulsory licensing arrangements implemented in copyright law.[11]

As music and other digitized goods circulate widely on the Internet, a significant body of scholarship evokes these parallels in support of a new

political bargain between old and new distribution channels. Most of these proposals are designed to permit P2P networks and other forms of informal digital distribution to continue to develop, while recouping revenue for producers and artists through taxes or compulsory license models.[12] They are designed, in other words, to enable a political adjustment of costs instead of a technological fix, which might constrain future technical and cultural innovation.

But digital media are distinct from earlier new media in ways that make a political resolution difficult. Earlier political bargains over the use of content (e.g., between record companies and radio broadcasters) were facilitated by the fact that distribution channels were scarce and capital intensive: Profit-sharing deals and structures of accountability still involved relatively few corporate owners, whose actions could be regulated and policed. The deals themselves primarily affected distributors, who operated their own relatively secure channels for content delivery with little risk of subsequent redistribution or reuse of content.

Earlier new media were also often modally distinct in ways that permitted relatively narrow bargains between different distribution channels. Buying a record, for example, meant buying a physical artifact that permitted certain kinds of use—for example, on-demand performance in combination with a bulky, stationary record player. This differed significantly from the ephemeral experience of radio, which supported fewer expectations of ownership, repeatability, and personal collecting. Although the two channels competed at one level for music audiences, they offered different structures of participation for consumers, which in turn supported different markets and revenue models. For much of the 20th century, communications policy emphasized and reinforced these distinctions, dividing the range of communication networks into as many models of practice: telecommunications services, information services, broadcasting, mail, and so on.

Early policy thinking about the "information superhighway" often advanced a broad agenda that included not just the digital delivery of movies, but also improved education, expanded political participation, greater international cooperation, and a host of other social goods.[13] However, it tended to view commercial investment as a prerequisite of those other uses and to assume that those uses were compatible with or at least separable from the commercial infrastructure—much as public broadcasting operated in parallel to commercial broadcasting. Taking this view, regulatory and tech-

nological solutions should first satisfy the wishes of commercial actors, notably through stronger legal protection for digitized content. Beyond the goal of universal access to broadband services, however, the requirements of a rich digital public culture remained underspecified and tended to draw heavily on the examples of existing public media and educational institutions. These analogies supported the notion of segregated functions for the media in public life with correspondingly separate infrastructures for content production and distribution. These assumptions were congenial to the industry view that the digital transition was primarily an opportunity to scale up business as usual—multiplying cable channels and creating frictionless markets for media services. Under a segregated services model, the other purposes of the public sphere were not their responsibility.

In practice, the combined action of the personal computer and the Internet undercut the separation of distribution channels. It did so not just for different forms of cultural expression—music, video, text, and so on—but also for the modal differences that shaped how and where such goods were consumed. The growth of individual capacities for large-scale distribution meant that new social bargains were no longer a game between industry rivals or a negotiated division of labor between established sectors (e.g., commercial and educational). Any new social bargain over use must be made with consumers.

This requirement makes the eventual scope of a new social bargain broader and more complicated, as it necessarily encompasses many more varied forms of expression and use. It is unclear where the borders of such an agreement would lie, either with respect to the forms of cultural production it contained or the implications it would have for the broader functions of freedom of expression and public life. A solution to the problem of one industry can have repercussions across the public sphere, affecting not only the circulation of music or movies, but also broader questions of access to knowledge, and of related capacities to speak, share, use, and innovate (Lessig, 2004; Benkler, 2007; Cohen, 2007).

As with earlier media revolutions, the constraints associated with the "old media" are falling away without the articulation of a stable new model. Despite enormous investments in DRM software, micropayment strategies, trusted computing architectures, and other long-sought components of a commercial network infrastructure, the Internet-based distribution of old media remains embryonic. From the perspective of content owners, there are

far too many ways in which content can proliferate—through the Internet, within computer systems, across home networks, on the increasing number of media-capable devices, and so on. Digital signals can be captured at many points within the existing network architecture. Analog signals can be digitized at the point of delivery (the so-called "analog hole" in discussions of digital television). Any weakness in the digital distribution channel can quickly scale across the Internet, turning one copy into millions. For these reasons, the content industries have been extremely wary of new social bargains around digital use. Instead of a political solution that extends the new capacities for individual production and distribution, the content industries have preferred to reengineer the technologies themselves to ensure a future of secure channels for digital culture.

In the end, building a secure channel requires that general-purpose computing give way to a much more carefully circumscribed system and network architecture designed to enforce copyrights and contractual agreements. Because this shift implicates related layers of technology and social practice, it requires changes to the hardware, software, laws, and ultimately social norms and expectations associated with a wide range of cultural practices. Because digital technologies so thoroughly disembed the rights and expectations we associate with existing media technologies, this shift invites a thorough reconceptualization of the objects of culture—of how we own and use texts, for example, once ownership and use is no longer circumscribed by the physical characteristics of the book, or of how we relate to recorded music, when the ownership of CDs gives way to contractual agreements governing the use of digital music services.

How this reconceptualization occurs depends heavily on who is empowered to innovate with digital content. As more capable digital infrastructures are built, the balance of power between cultural producers, intermediaries, and consumers is shifting, with broad consequences for cultural participation, freedom of expression, and capacities for cultural and technological innovation.

Different cultural artifacts and media have supported (and usually required) a diverse collection of cultural practices and institutions. In many respects, this allowed different media to fulfill distinct social functions and for those functions to acquire the recognition and protection of law. The rights accorded books as a durable record of culture were different from those accorded broadcast television, which until recently was an

ephemeral good from the consumer's perspective, limited to single viewings. The digital transition is erasing these social textures of different media. E-books can be packaged with restrictions that close off their public utility as unpredictable vectors of dissemination and knowledge—no resale, no marginal notes, no cutting and pasting without authorization. Now the video record no longer needs to be as ephemeral, or as difficult to categorize and search.[14] The enabling technologies for new forms of expression, dissemination, and cultural memory continue to drop rapidly in cost. A vast quantity of creative work is produced and distributed for free—video, animation, journalism, software. The sustainability and scalability of much of this work remains an open question, but one that has remained open now for over a decade, subsisting and growing on a wide range of commercial and noncommercial incentives. This proliferation suggests a basic fallacy at work in the equation of cultural creativity with the health of the content industries or with quantitative measures of cultural goods produced or sold. Expressive forms and their modes of circulation change, as do the institutions that mediate them. Few mourn the passing of the piano player or measure the health of American culture by its number of original operas. The fragile economics of blockbuster films and hit albums suggest a similar fallacy, and should not drive debates about creativity or dictate choices about the basic technological infrastructures that support it.

In the early 1960s, when Jürgen Habermas (1988) wrote about the "refeudalization" of the contemporary public sphere, he was warning about the breakdown of the complex social, economic, and technological arrangements that underwrote practices of public dialogue. Among his most concrete worries were the concentration of ownership of the channels of mass communication and the rise of a model of passive consumption for media content. He saw public discourse increasingly dominated by the consumption of packaged views, administered by a shrinking number of powerful corporate intermediaries. Although the right to free speech remained politically sacrosanct in the societies he described, it was an increasingly atomized right, divorced from the conduits of speech that mattered most in contributing to public discourse. Although there was no conspiracy to undermine dissent or diversity of views, there was a gradual alignment of media interests with the state, as media entities grew and began to influence the state and as the mass media became the chief stage for the display and legitimation of authority (the root of Habermas's analogy with feudalism). Over time,

Habermas argued, this process eroded the discursive habits and independent capacities for judgment that gave substance to democracy's formal exercise in elections.

When James Boyle (2003) and other contemporary legal scholars warn that the expansion of intellectual property rights represents a "second enclosure movement," analogous to the privatization of English common land, they are describing the capture of legal and regulatory processes by the content industries (and also by patent-based industries in the life sciences and information technology). When I explore, in Chapter 16, the mix of technologies and laws that underwrites visions of a secure distribution channel for media, I am describing efforts to change the *conditions of possibility* of culture, giving content owners new power to make far-reaching decisions about what can and cannot be done with cultural materials. One need not subscribe to Habermas's political psychology or to Frankfurt School accounts of mass culture to understand the power of these efforts to shape social expectations and norms—and of technical infrastructures, in particular, to naturalize sets of prescribed uses. What matters from this perspective—and manifestly also from the culture industry's perspective—is not the interpretive freedom that people exercise in their capacities as cultural consumers, or the endlessly inventive margins where cultural roles are disputed and new practices emerge (which in any event are now mined as new sources of industry content), but rather the capacity to safeguard the industrial model of cultural production against obsolescence and to extend its relatively strict division of roles. Content industries maintain a "structure of participation" whose ideal form runs one way from closely knit production and distribution networks to carefully primed consumers. The point here is not that some technologies underwrite more engaging forms of experience than others—as McLuhan argued for television and Sven Birkerts (1994) for books, for example—but rather that the nature of that engagement is carefully controlled in both instances. What relates television and the book, for our purposes, is not that the book enables a more demanding or reflective engagement with ideas than the television, but that—in the current environment—neither permits creative appropriation by or substantive dialogue with the creator's contemporaries in ways that do not also pass through the culture industry intermediaries. As Gregory Crane notes (Chapter 3, this volume), Plato's complaint that writing is mute to our inquiries bears deeper consideration in our era. In blogs, remix culture, and other distributed aspects of digital

culture, we see the growth of a more participatory, less regimented, real-time cultural dialogue.

The trends that Habermas and Boyle describe follow accelerating curves through the modern era—Habermas's tracking the rise of the mass media; Boyle's mapping the spread and intensification of intellectual property rights regimes. Both align with broader stories about the growth of industrial society and the transition to a network society, an information society, a knowledge society, or its many other cognates. These linked processes have been incremental enough and slow enough to permit backward glances toward moments of balance, in which the margin of unregulated use was broader—to pre-1976 copyright law, which required the explicit registration of copyrighted materials, or to a culture of print, radio, and TV production dominated by small owners (the 1980s suffice for all three). Looking forward we have much less assurance. Not because certain claims won't be predictably advanced—such as the need for a further Copyright Extension Act, or for other views of intellectual property that increasingly resemble natural rights—but because we are caught in an old-fashioned contradiction that we cannot yet see through: the triumph of the culture oligopolies at a moment when their necessity is coming to an end.

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notes

1 The terms are often used interchangeably: content industries, in reference to the production and distribution of cultural goods, and copyright industries, in reference to the legal instrument that defines rights of ownership and control over their products. The major actors in this category are the motion picture and television industries, the recording industry, the publishing industry, and the commercial software industry (which benefits from copyright protection). I prefer the term "culture industry," with its heritage in critical accounts of cultural agency.

2 The "sneaker net" and the search and latency issues associated with it was analyzed by Microsoft software engineers Biddle, England, Peinado, and Willman (2002).

3 As in Basic Books's successful 1991 suit against Kinko's copy shops for copyright infringement in the mass production of course packets. In the wake of the decision, the reproduction of course packets fell back on the less efficient but probably no less prevalent sneaker net.

4 See especially Section 8 of the Constitution: "The Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

5 Such rhetoric is not new. Similar language was applied in the past to other technologies that threatened market incumbents: the player piano, radio, television, and (by Valenti himself) the VCR.

6 The terrorism charge—drawn in this case from Interpol, which like other national and international police agencies has been enlisted in this fight—is reported here: http://www.hollywoodreporter.com/thr/article_display.jsp?vnu_content_id=1000528473

7 For an account of this commercial structure in the United States and globally, see Miller et al. (2001) and Litman (1998). For a breakdown of the production costs of *Spider-Man 2,* see Thomas (2004). On marketing in the book industry, see Mandell (1995). On the media mix, see Ito (Chapter 6, this volume).

8 Efforts by RIAA to scale up legal enforcement has led to a variety of legal shortcuts such as the practice of sending "pre-lawsuit" settlement letters to suspected infringers and the (so far failed) effort to bundle individual infringement cases in the courts.

9 See, for example, *Frontline*'s report on the impact of corporatization and consolidation of the music industry on the cultivation of new talent: http://www.pbs.org/wgbh/pages/frontline/shows/music/perfect/corp.html

10 Nearly all studies have found a mix of such uses, including Lenhart and Fox (2000), Rainie and Madden (2005), and Oberholzer-Gee and Strumf (2007). The range of early Napster-related reports is parsed by Liebowitz (2002); see also Pollack (2005) for a survey of recent work.

11 Timothy Wu (2004) calls this pattern the basis of the "classic communications regime," which regulated not authors but industrial competitors. Modern copyright law deals preponderantly with these industrial relationships. See also Litman (2001).

12 For example, the Electronic Frontier Foundation's advocacy of a "voluntary collective license" for a blanket right to share music (EFF, 2004), or William Fisher's case for a compulsory license supported by a tax on Internet access and/or blank media (Fisher, 2004).

13 See, for example, the U.S. Patent and Trademark Office report on "Intellectual Property and the National Information Infrastructure" (Lehman, 1995), or Al Gore's speech to the "Superhighway Summit" (Gore, 1994). Also Goldstein (1994).

14 For both the e-book example and an account of Brewster Kahle's television archive, see Lessig (2004).

15 Price Discrimination and the Shape of the Digital Commodity

Tarleton Gillespie

the uses of incompatibility

Competition between nations has often produced incompatible technical standards. There are separate U.S. and European standards for television signals and electricity infrastructures; the United Kingdom parts ways with continental Europe on many points of infrastructure, from distinctive electrical sockets to right-side driving. Military purposes often justified strategic incompatibilities in widely used technologies, such as national differences in the gauge of train tracks or the caliber of rifles. Economic purposes were also common, such as insulating domestic markets by raising the costs of entry to foreign competitors (Slaton & Abbate, 2001; Tassey, 1995).

Early national choices regarding basic infrastructure tended to create "path dependencies" that shaped future developments and hindered the interconnection of national or regional systems (David, 1985; Hughes, 1987). The growth of global information networks reflects, in large part, the rise of a countervailing system of rewards for technologies and standard-setting processes that enhance interoperability, rooted in the concept of "network effects" and in the broader conceptual linkages between innovation, welfare, and trade characteristics of global capitalism. By a mix of accident and design, these processes have left us with a relatively small set of interoperable standards governing major communications infrastructures: one Internet, a few input–output (I/O) designs, shared file transfer protocols, and so on.[1]

The welfare-enhancing effects of interoperable networks are grounded in classical economics: Lowered transaction costs in moving from one to the other increase the volume of transactions (of information or goods), raising all boats. When the network is operated by a global cartel, however, a different structure of participation comes into play. The development of the DVD by the major film studios in the 1980s is a good example of this dynamic. The DVD stakeholders orchestrated a system of *regional coding,* a technical incompatibility designed to divide the international market (in this case, into six distinct zones, roughly corresponding to the continents). From a technical perspective, this was quite simple: Each disc contains a single bit of information that indicates its region of origin. Each DVD player checks for this bit and compares it to its own regional code. If the codes do not match, the device refuses the disc. In practice, this means that a disc purchased in the United States will not play on a European device, and vice versa. The DVD Copy Control Association (DVD-CCA) was established to act as sole licensor of this and other DVD technologies (such as the Content Scramble System [CSS] encryption method,

whose trivial cracking later became a test case of the anticircumvention clause in the Digital Millennium Copyright Act). Sole access to studio content enabled the DVD–CCA to enforce strict licensing terms, such as the requirement that DVD players output their contents only in formats approved by the studios. Together, these legal and technical protections established a chain of control: Encryption necessitates the license, the license regulates the manufacturer, the device regulates the user, and the contractual relations between them are backed by law.[2]

The film industry has historically discriminated between various markets—distinguished by time, medium, and location—to sell its product at an optimum price in each. Studios typically cascade the release dates of their films in various media. In the United States this usually means a progression through first-run theaters, second-run theaters, pay-per-view, hotel rental and in-flight screenings, video sales and rental, premium cable, basic cable, and network broadcast. Each version is generally cheaper than the last, and often of lesser perceived quality. International market segmentation follows similar strategies, from staggered international release schedules[3] to price discrimination in the international marketing of DVDs—shifting prices somewhat closer to the relative purchasing power of consumers outside the United States and Europe.

Price discrimination would be undercut if consumers could purchase DVDs at low prices in local markets and resell them elsewhere at higher prices, or if e-commerce sites could simply sell discs on an international scale at the lowest price. Regional coding reduces the opportunities for this kind of arbitrage, ensuring that the studios can set region-specific prices themselves. The ability to block arbitrage also assures opportunities for secondary exclusive distribution deals between studios and local partner companies. Partner companies will not have to compete with discs imported from other regions. In practice, studios need not even release a film in all regions if market prospects are poor. Although this is rarely the case with major Hollywood releases, it is routinely the case with foreign releases in the United States, which have no independent distribution networks.

There is no technical legacy underlying the region code—no path dependency, only a market logic that encourages inefficiencies at one level (interregional trade) to achieve greater market power at another (regional price discrimination). The cartel power of the studios allows them to shift the costs of this bargain to hardware manufacturers, who must license the underly-

ing technology, and to consumers, who find their consumption habits tied to regional infrastructures.

digital distribution and individual price discrimination

With the shift to online distribution, technically enforced regionalized pricing can be deployed even more effectively. Apple's iTunes Music Store, for example, has established different pricing structures for different countries; their digital rights management (DRM) system ensures against arbitrage, and their servers can automatically channel local users to the appropriate national site.[4]

But price discrimination by country or region goes only part of the way in achieving potential market efficiency. The limitations of the brick-and-mortar distribution of DVDs make it difficult to distinguish between markets in terms more fine-grained than continent and format; the cascading release can only distinguish between buyers in the broadest strokes. With online delivery, paired with databases that record consumer purchases and preferences, pricing schemes and release dates could be tailored *to individual consumers.* Charges might be adjusted not only by region, but by previous purchases, internet service provider, or membership in studio-specific "frequent buyer clubs." Preferences can be (and increasingly are) tracked, aggregated, analyzed, catered to, and used to set prices based on the best guess of what that user could and would pay. This kind of price discrimination can be cloaked as "bundling," in which packages of goods and services are priced together: iPods with half-price iTunes downloads, HBO and AOL music packages, Time Warner broadband along with freedom from advertisements on Warner Bros. DVDs.[5]

The digital distribution of cultural goods and the collection of customer information are linked processes: The latter supports the distribution scenarios and marketing schemes associated with the former. Price discrimination requires consumer data; the seller must know something about the buyers in order to assign them to a price category. DRM systems enable this linkage by regulating both user identity and the delivery of services: Users are authenticated before services are delivered. Next-generation DRM techniques extend this principle further by assigning decryption keys not to regions or to classes of devices, but to individual devices, enabling a new level of granular control of media consumption. Increasingly ubiquitous network connectivity for computers and electronic appliances enable not only enforcement of licenses but also the updating of DRM software and the close tracking of evolving consumer preferences.

Diminished privacy is an increasingly common price for access to digital services. The click-through contracts that accompany software installation are used to establish nominal user consent for various forms of surveillance, ranging from "tethered" media players that report titles back to their vendors to more invasive forms of spyware. Data collection and consumer profiling across the Web allow commercial entities to know a great deal about consumers; e-commerce sites increasingly encourage consumers to volunteer personal information as the basis for an ongoing "service" relationship that extends beyond discrete transactions; "cookies" allow a simple way for sites to record and retain individual information about repeat visitors (Agre, 1998; Brin, 1999; Cohen, 2003; Garfinkel, 2000).

Consent, when it exists at all, is severely limited by the length and complex language of software licenses. Even standard licenses are opaque to nonlawyers. By most accounts, they almost always go unread (see Lemley, 1995; Szabo, 1997). At present, there are no significant legal checks in the United States on these provisions. Liability for the misuse of private information is weak in U.S. law. Contractual arrangements, in contrast, are highly binding; the bnetd ruling described by Robert F. Nideffer (Chapter 12, this volume) recently affirmed the power of click-through provisions. The security of private information, in this context, depends on one's confidence in the security of the DRM code and the good intentions of the corporate owners.

A wide range of models for exploiting the new streams of consumer data are in use or development, from variable pricing based on the release of personal information to marketers, to incentives to watch additional commercials. The personal information required by DRM systems is transformed into a commercial asset and enabler of new services:

With Active Internet's DRM . . . the license acquisition process allows companies to gather targeted customer information. For example, many music distribution Web sites now request the consumer's e-mail address in exchange for audio file licenses. Music distribution companies can then use this e-mail address to keep the consumer up-to-date on concert schedules and new compact disc (CD) releases, or to market-related merchandise. Alternatively, unsigned bands can upload and market their music directly to fans using DRM technology, while record labels can generate interest in new bands by offering free downloads of their new music.[6]

The ease of price discrimination via DRM is likely to further encourage the transformation of fair use rights into "fared use,"[7] whereby users pay more to

enjoy the kinds of transformative reuses currently protected by law. As the Congressional Budget Office (2004) observed,

DRM would enable copyright owners to charge a price for their creative works that varied according to the particular use(s) made of them. No longer buying a work at the base price and enjoying wide subsequent rights of use, consumers would instead pay a price indexed to distinct rights over the copyrighted work. (p. 23)

content protection versus protectionism

In the United States, individual price discrimination—linked both to concerns about the abuse of monopoly power and to a broader notion of market fairness that dictates equal access to the lowest priced services—has historically been unpopular with consumers. Maintaining this balance was long viewed as a government responsibility.[8] Increasingly, this consumer-oriented role is stood on its head. Consumers, this logic goes, will be better served by the wider array of services and products enabled by price discrimination. A fixed price will cut off low-end markets that a flexible price may reach (see, e.g., Cohen, 2000). Through means such as the Digital Millennium Copyright Act and other control-friendly initiatives, government plays a growing role in securing the architecture for this market model. Today, the efficiency arguments for price discrimination are much better developed than they were in past decades, better aligned with concentrated media markets, and—most importantly—more fully supported by the technologies of the day.

The economics of cultural goods are particularly suited to price discrimination: Cultural goods have high, fixed initial costs but rapidly diminishing marginal costs. But cultural goods have both a social and an economic life; copyright law says as much. Culture is a resource for democracy and learning as well as a commodity in the market. Copyright law established limits on control to balance the relationship between culture as commodity and culture as a public good.

"Content protection" is the mantra of DRM ad copy, but what is content being protected from? Answers are inevitably diverse: sometimes piracy, sometimes arbitrage, sometimes consumers switching away from a particular service, sometimes fair use practices, sometimes personal, noncommercial uses. As danah boyd (Chapter 8, this volume) argues, much of the complexity of culture—its shifting roles, interpretations, and audiences—is lost in the translation to flatter, digital versions of cultural life, often with unpredictable results.

Although price discrimination is theoretically a neutral intervention in the cultural sphere—and standard economic arguments would posit it as a social good that incentivizes cultural production—price discrimination linked to more complete control of the life of the cultural commodity is fraught with risk. Although it can expand the market for cultural goods, it also recaptures hard-to-quantify social surpluses derived from the ways in which these goods circulate outside market relations—illegally in some contexts but in ways expressly protected by copyright law in many others. In the current climate, this capture is celebrated by the major content owners as a requirement of digital services. Price discrimination can be presented as a social good that justifies DRM, which in turn can eliminate unauthorized uses (and competitors) in a fully discriminated market. The difficulty is that, in a democratic society, those uses have always included the noncommercial, public life of cultural goods.

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notes

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1 For more on this subject, see, for example, Abbate (1999), Bradner (1999), Drake (1993), Garfinkel (1998), Kahin and Abbate (1995), and Kesan and Shah (2001).

2 For more on the copyright implications of this arrangement, see Gillespie (2004; 2007) and Jackson (2001).

3 This strategy is fast disappearing as studios try to diminish the window of opportunity for DVD pirates.

4 This issue is currently being investigated by the European Commission as a potential violation of rules on commerce within member states.

5 A similar technique has been proposed by cable Internet providers, wherein connections to partner websites would be allocated higher bandwidth. Yochai Benkler (2006, p. 147) raises this point, in reference to a 1999 white paper published by Cisco, called *Controlling your network—A must for cable operators*, available at http://www.democraticmedia.org/issues/openaccess/cisco.html.

6 Active Internet, *DRM benefits*, retrieved August 17, 2005, from http://www.activeinternet.com/drm/drm_benefits.asp

7 See Bell (1998). For the array of concerns about how DRM itself may restrict fair use, see Burk and Cohen (2002), Erikson (2003), Felten (2003), Samuelson (2003), and von Lohmann (2002).

8 In 1887, for example, the Interstate Commerce Act ended the long-standing tradition of individual price discrimination for train tickets.

16

The Ecology of Control: Filters, Digital Rights Management, and Trusted Computing

Joe Karaganis

The Internet was not designed as a distribution channel for media. Rather, it was a communications network, which gradually grew capable of communicating rich media content. Its architecture privileged the transmission of data, not the identification or control of what was conveyed. It was, in this respect, an open network, indifferent to the uses to which it was put. In the mid-1990s, as culture industries began to understand the Internet as a competing, uncontrolled distribution network for their goods, they had to confront this infrastructural fact. The underlying problem was not that tens of millions of file sharers seemed indifferent to copyright norms, but that the networked computing infrastructure itself could not guarantee the unique market conditions for cultural commodities—widespread distribution *and* controlled scarcity.

The complementarity between open networks and personal computers was not accidental, though in some respects its survival has been. The personal computer grew out of (and was sustained by) a broader culture of general-purpose computing which, from computing pioneer Alan Turing's day forward, treated computers as universal machines, capable of solving any problem that could be expressed in generalized programming languages. Software could be developed to almost any purpose, from atmospheric modeling to accounting to video compression. Hardware development also relied on relatively open frameworks that encouraged tinkering and innovation. Buses and ports, which govern input and output (I/O) within and between devices, favored minimum and open standards for connectivity. Their key feature was to impose few constraints on what was connected to the microprocessor or on how those "peripheral" devices were used. Over time, this allowed computer system components to diversify and evolve at different speeds, requiring less frequent revisions to the underlying architecture.

Developments in network technologies followed a similar path: The Internet embodied and to a large extent consolidated the notion of "end-to-end" networking, which held that any two parties should be able to communicate without the intervention of a third party, and—by extension—that the most widely shared protocols should be the least constraining.[1] Initially, these principles served the predominantly military goal of ensuring that communications networks could survive the destruction of individual nodes (e.g., by nuclear attack). In practice, this goal required solving a range of interoperability issues between the electronic networks that predated the Internet, and that subsequently composed it. Collectively, these efforts cre-

ated a network that supported not only survivability and interoperability but also a very wide scope for future innovation. The lowest-level internet protocols provided a platform for other networks and applications with more specific functionality. The World Wide Web, with its markup language (HTML) and hyperlink structure, is only one example. Instant messaging systems, peer-to-peer file sharing, and internet telephony are others.

Closed systems and centralized networks differ not in their absolute capacity for innovation, but in the control that system owners exercise over them. For cable television systems or gaming consoles, corporate owners retain the prerogative to decide how the system evolves. Like traditional content industries, they box out challenges to their infrastructure while profiting from—and providing third parties the opportunity to innovate around—fixed-format content. For some 70 years, AT&T's telephone system was the exemplar of a closed network, managing all communications and exercising control over what could be attached to the end of the phone line. In the United States, cellular phone networks operate on similar principles, with vendors dictating both the hardware available to users and the uses the network will support.

Centralized control offers a number of advantages. End-to-end networks and open architectures are poor at prioritizing among different objectives—"bad" uses compete for network resources with "good" ones. Innovation in end-to-end systems can be difficult to coordinate and aggregate; interoperability between systems becomes more challenging when there is no controlling authority to enforce compliance with standards. Innovation within a network, under these circumstances, acquires a strong social dimension, as each actor weighs the costs and benefits of change. Open source software projects, which sometimes manage contributions from hundreds or thousands of volunteers, typically address these issues by maintaining hierarchical control over the integration of new code. They rely on benevolent dictators or other carefully managed structures of authority to prioritize and evaluate innovation. For these reasons, "intelligent" networks that can discriminate among uses and users have been the norm when the ownership of the infrastructure and the functions of the network are clearly defined, as in ATM banking networks.

Content companies and technology companies have traditionally viewed these structures differently. Although end-to-end networks permit more sources of innovation, their lack of discrimination undercuts pricing opportunities for services carried over the network, which in turn limits the

market power of incumbents. Many companies—including technology companies—have been on both sides of this issue, defending openness in markets where they are minority players, while working to create chokepoints in areas of innovation where they dominate, which allow for "supernormal" profits. This is the structural complaint against Microsoft's role in the operating system market, but it extends to many other market positions and technologies: I/O buses, media players, devices like videodiscs and DVDs, and so on.[2] Internet Service Providers (ISPs) have also been on both sides of this issue, acquiring immunity from liability for illegal content carried over their networks (in 1995), but also freedom from "common carrier" provisions that allowed competitors to use their networks (in 2005). The latter development promotes the growth of vertical monopolies that can link internet service provision and content production. Time Warner, News Corporation, and General Electric all have substantial, interlocking interests in both ISPs and media production. Although this consolidation has not yet produced overt discrimination of internet content in the United States—and may never if "network neutrality" principles are written into law—service providers practice subtle forms of regulation through such measures as "asymmetrical" upload and download speeds, which favor a consumption-oriented model of internet use. Home-operated servers, which shift the user from consumption toward production and distribution, are often penalized or contractually forbidden.

securing the distribution channel

Napster and newer file sharing networks are examples of the unpredictability and low barriers of entry associated with end-to-end innovation—the original Napster, like the first Mozilla browser, was written by a college student and freely disseminated on the Web. Because of the Internet's open architecture, no technological constraints, controlling authorities, or market incumbents prevented their widespread adoption. As these and other innovations demonstrated, the Internet can support not only new content but also new and rapidly evolving distribution models.

The content industries have adopted a variety of tactics to combat this proliferation of distribution channels, from education campaigns, to efforts to co-opt file sharing in "high-risk" communities, such as universities,[3] to continuous legal action against file sharing network owners (e.g., Napster, Sharman Networks, Aimster, Grokster, Limewire) and individual users of those services (some 18,000 by 2006).

The impact of these efforts is unclear. Some studies have suggested a correlation between the legal threats against individuals and apparent dips in file sharing numbers, but by most accounts the numbers have fluctuated since 2003 and measurement difficulties abound (Rainie & Madden, 2005; Hindo, 2004). Nearly all the major actors in the content industry understand these legal efforts as stopgap measures—bad for public relations and of dubious value in slowing the growth of informal distribution, but of potentially greater value in fostering a political climate in which more effective legal and technical solutions can be enacted. As the late Motion Picture Asssociation of America (MPAA) president Jack Valenti made clear, the longer term and more consequential goal is to transform the principles of openness that make computing culture such a dangerous environment for media companies, and to erect legal protections around this new technical and cultural infrastructure. Nothing less will "build the barricades tight and strong so that creative works are shielded and made safe in order that investments in more and more programming can be planned and made without fear of being burglarized by others" (Valenti, 2000). Nothing less will ensure that the distribution channel is successfully remediated—that is, returned to the old intermediaries.

Jack Valenti's retirement from the MPA in 2004 marked the departure of one of the dominant voices in political debates about digital culture. For Valenti, culture was synonymous with the major culture industries, and an uncontrolled distribution system was an unequivocal and growing threat. Valenti was less open about the extent to which this "crisis" of the content industries also represented a vast new business opportunity. The same technologies that expanded the power to copy and distribute digitized cultural goods could also tilt the other way, and dramatically enhance the power of rights holders to control distribution and consumption. The technologies that permitted new forms of access to content also enabled new forms of audience surveillance and marketing, which might diminish the unpredictability of the consumption channel by allowing more precise matching of products with targeted demographic groups. In Chapters 14 and 15 of this volume, we explored the cultural and market logic of this vision. In this chapter, we explore the technological methods.

filter

Napster, the first peer-to-peer (P2P) file sharing network, was launched in 1999 and developed quickly into a 70-million user community. Napster pro-

vided fresh answers to two problems associated with distributed resources in digital networks: the search problem, or how to identify resources scattered across millions of individual machines; and the bandwidth or continuity problem, or how to ensure that large files could be reliably transferred across a network characterized by intermittent connections and/or uneven bandwidth. Napster answered the first question by providing a centralized database for listing files distributed across a large number of individual machines. This database brokered relationships between those seeking resources and those holding them. Napster addressed the second challenge, continuity, by providing a means of tracking the presence of users on the network. This enabled file transfers to be interrupted and resumed over time, thus greatly reducing the penalty of file sharing over low-speed or erratic connections.

With these relatively modest innovations, Napster succeeded in leveraging the contemporaneous development of several other technologies: a widely available audio compression format (MP3, patented in 1996), personal computers powerful enough to run MP3 "codecs" and reproduce high-fidelity audio, and the growth of commercial broadband services, which allowed individual "super-sharers" to emerge as key distribution points on the network.[4] Together, these technologies combined to make an effective extracommercial distribution channel (and also de facto archival technology) for music. Because music had relatively modest technical requirements for digitization and high-quality reproduction—compared, for example, with the high-bandwidth requirements of film or the cumbersome screen technologies that continue to limit e-books—it was an optimal good for early peer-to-peer networks.

By all accounts, Napster thrived on the exchange of copyrighted music. Although the number of infringing files and successful transfers is hard to determine, there were 2.79 billion *initiated* file transfers at Napster's peak in February 2001. In 1999 the Record Industry Association of America (RIAA) brought a copyright infringement lawsuit against the company. It argued that Napster bore responsibility for the infringing behavior of its users, even though Napster had no control over those uses, and even though the network also supported a wide range of legal behavior, such as the sharing of public domain works, pictures, and—in large quantities—amateur pornography. Napster argued that, as a neutral service provider rather than a content provider, it benefited from "safe harbor" provisions in the Digital Millennium Copyright Act—the same provision that had been successfully

invoked by ISPs in 1998. Unlike the ISPs, Napster lost this argument: The presiding judge ordered Napster to eliminate infringing files from its network.

The scale of this task necessitated a technological fix. Napster began by filtering files that bore the titles of copyrighted songs—initially some 250,000 titles supplied by the record industries. This reduced the sharing of infringing files, but the permutations of titles made the system unreliable: Infringing files slipped through, and legitimate files were sometimes stopped. Music sharers took advantage of this inflexibility by renaming songs. During Napster's appeal in 2000, the RIAA successfully argued for a stricter standard: File sharing would be permitted only if copyright protection was perfect. Napster had prepared for this outcome and implemented, in June 2001, a system designed to identify songs by their sound, to be checked against a database of copyrighted songs. This filter proved wildly indiscriminate. Overnight, it eliminated nearly all traffic from Napster's network. Usage plummeted, and Napster shut down definitively in July 2001.

Content filtering is an appealing mode of control for regulators and other actors who are uncomfortable with the lack of traditional intermediaries in the end-to-end world of the Internet. Filtering addresses the asymmetry between the offline world and the Internet, reinserting intermediaries with the capacity to discriminate content before it reaches the end user. When "good" file transfers, page visits, or other uses of the Internet can be distinguished from "bad" ones, the Internet can become a much more powerful tool for social regulation. It can replicate and extend the kinds of social, institutional, and material barriers that regulate conduct and access to information goods in the offline world, separating children from pornography or citizens from unauthorized news, or reducing the effective scale of copyright infringement. In this respect, filters try to reproduce nondigital sociotechnical arrangements and the power relationships that define them. Unlike those arrangements, however, filters have fewer points at which power is visible or negotiable. They can deny not just access to resources but also to *knowledge of resources* more completely than in other kinds of social space. In the offline world, the exercise of such power tends to be thickly mediated by laws and norms, by the materiality of technologies, and by the friction of social relations. In the digital environment, this social and institutional context is much thinner, making slippery slopes on issues of control or surveillance easier to descend, and transgressions of privacy more difficult to specify. In networked computing environments, there are few practical dis-

tinctions between a little control and a lot of control—enabling one often enables the other. The borders between public and private are less clearly drawn and the means of establishing them are often technically demanding.

To filter is to monitor and parse communication. There are formidable challenges to discriminating content beyond the grossest level, even for works as distinctive as music or video files. Simple workarounds, such as encryption, make the identification of files problematic (see, e.g., Brief *Amicus Curaie,* 2005). Content filtering also faces a practical and politically charged difficulty regarding the point of application: Where should filters do their work? The Napster case revealed the limitations of targeting individual services. As Napster's filter diminished its value to users, music sharers simply moved on to other file sharing networks—Grokster, Morpheus, KaZaA, eDonkey, and others. By most accounts, the global file sharing community is now larger than during Napster's 100 million-user heyday (OECD, 2004). With the Napster case, the music industry proved that it could crush institutional competitors, but not control the Internet itself. The new P2P services learned from Napster's vulnerability and adopted fully decentralized network models that distanced network owners from responsibility for—or even knowledge of—the content circulating on the network. Unlike Napster, the new services had no central directory. In addition to complicating legal efforts against network owners, this structure made filtering more difficult at a technical—not merely contextual—level. Without a centralized database to govern resources, there is no obvious point of application for filtering technology. Advances in filtering technologies, such as new tools for identifying "audio fingerprints," haven't escaped this architectural tradeoff.

Although Internet Service Providers have been mostly successful in avoiding liability for the activities carried over their wires, their central role in internet access makes them a logical and attractive target for content filtering.[5] Renewed RIAA attention to ISP filtering in the United States has focused on universities, which typically act as ISPs for their student bodies and have a potentially higher degree of liability for student activity. If RIAA succeeds in establishing this liability, universities will begin to bear the costs of an "arms race" with file sharing networks and other related technologies (Fisher, 2007).

ISP-level filtering of this kind remains technically daunting: Parsing heterogeneous ISP traffic is much more difficult than scanning self-selecting file sharers, and the possibilities of defeating such filters (e.g., via encryption) are numerous. General filtering of internet use also runs up against power-

ful free speech claims and more diffuse expectations of online freedom. This former issue, especially, has blocked efforts to force commercial ISPs to play a filtering role. The RIAA hopes that the university–student relationship will allow for a different arrangement of rights and expectations—one that, in all likelihood, will not look like the current Internet. Content filtering on a large scale will inevitably sweep out protected forms of speech and expression along with infringing material: file sharing networks, like the Internet itself, support both. The Communications Decency Act of 1995, which required intermediaries to filter or otherwise control access to "indecent" Internet material, was declared unconstitutional on these grounds.

Filters operate, in many respects, on the presumption of a heterogeneous system—they operate in a context of diverse and changing services and network flows. This imposes a high complexity cost in distinguishing different kinds of content. To date, machine evaluation of context and meaning is poor, and choices made by human editors inevitably reflect a range of conscious and unconscious biases. Filters work best when the values they check are themselves binary—copyrighted/not-copyrighted, on/off. The problem suggests its possible solutions. What if copyrighted works could be distinguished by the presence of a binary tag, built into digital files? What if the network could be made less heterogeneous?

digital rights management

Content filtering is not the only form of cultural regulation applicable to digital networks. Digital rights management (DRM) systems take a different approach to cultural regulation: rather than sort through heterogeneous materials, DRM systems tag and encrypt cultural goods at the outset and provide authorized end users the tools for unlocking that content. Authorized users and uses are determined by the content provider and mediated through end-user contracts—notably, the "click-through" agreements that precede the installation of most software. Increasingly, these contracts provide for the ongoing monitoring and updating of software by the provider over the Internet, enabling forms of control that extend beyond the sale (von Lohmann, 2002; Godwin, 2003; May, 2006)

DRM efforts, to date, have been disorganized and mostly unsuccessful. Many narrow and incompatible systems have been pushed into the marketplace, reflecting corporate anxiety about control but much less attention to consumers' expectations about the permissible or convenient uses of

digital goods. A 2003 report on e-books sponsored by the American Association of Publishers and the American Library Association notes a number of areas where existing DRM strategies have undermined the acceptance of digital formats. Chief among these were the lack of platform neutrality (e.g., across Mac, PC, and Linux systems), the lack of portability (of files between devices or machines), the lack of transferability (of files to another person), and inadequate excerpting, highlighting, or print features. Many of the same complaints can be applied to other digitally distributed media, such as music and, increasingly, video.

Deirdre Mulligan, John Han, and Aaron Burstein (2003) raise additional questions about the continuous and often surreptitious monitoring that accompanies many DRM systems. Because these systems cannot be legally disassembled and analyzed, due to provisions of the 1998 Digital Millennium Copyright Act (DMCA), it is difficult to know what they report back or how company claims about privacy are to be verified. Competition among the major content holders creates a different order of problem, as companies vie for the control of media delivery platforms. There are, for example, multiple, competing DRM formats for the commercial sale of digital music, each vertically integrated across hardware and software systems.

The proliferation of systems reflects not only different corporate judgments about consumer expectations but also the ubiquitous use of DRM as a tool for market segmentation and competition. An industry snapshot of digital music from summer 2004 provides an idea of the pattern: Apple's FairPlay DRM is part of a vertically integrated commodity chain that runs from the company's licensing deals with record companies to its online music store to its media management software on individual computers to its dedicated player device, the iPod. The iPod supports Apple's chosen digital audio format, AAC, but not Microsoft's WMA format. Microsoft, for its part, has declined to make an Apple-compatible version of its media player software, with the consequence that music services that use WMA (like the relaunched, industry-sponsored Napster or Musicmatch store), can't sell to either Apple computer or iPod users. Real Networks tried to build its own vertically integrated commodity chain around an online music store, its Helix DRM architecture, and RealPlayer media player, but it had only limited success, and has since devoted considerable energy to breaking open the closed DRM commodity chains of Apple and Microsoft. Until 2006 Sony insisted on its own audio compression format, called ATRAC. The deliberate incompat-

ibilities among these systems meant that all players supported the de facto standard, MP3, which has no DRM strings attached. To date, music DRM operates at the margins of a larger "open" MP3 ecology. With the recent decision by EMI to offer its catalog DRM-free, through iTunes, it is possible that this costly phase of DRM experiments may be drawing to a close.

Real Network's effort to reverse engineer Apple's FairPlay is an example of how firms try to enter new markets by cloning products—better, cheaper, or differently—that can provide access to larger system ecologies. Reverse engineering is a protected right within international patent law and a basic principle of technology transfer. The history of the personal computer is largely a history of this practice—of competition among component makers made possible by stable (and often open) architectures and standards. Self-updating DRM systems, continuously in contact with the corporate licensor, permit incumbents to break this practice by continually changing the details of system architecture. When hackers developed FairUse, a software utility designed to allow the legal owners of iTunes music files to remove the constraints of FairPlay DRM, Apple quickly updated iTunes to refuse these files. Apple also retaliated against Real Networks with an update that refused Real's FairPlay hack. The persistent connection to the vendor after sale, in the DRM world, means that the vendor has much greater power to refuse outside innovation and block competition. The vendor also exercises discretion over the portability and transferability of content, as with the arbitrary device limits that encumber iTunes and other music services. Other digital media have their own strategies of control: Adobe's e-book Reader software is integrated into its document management products, and is incompatible with Microsoft Reader e-books; Microsoft Reader, for its part, won't work on Apple or Linux systems. All the readers are incompatible with the now defunct Gemstar Rocketbook system, which was one of several efforts to bind e-books to dedicated reading devices. In practice, any socket, connection, or exchange can be DRM-protected—Lexmark, Hewlett-Packard, and Xerox printers all contain embedded logic that can refuse generic cartridges or, in Hewlet-Packard's case, set an expiration date regardless of whether the cartridge is empty.[6] The value chain can be secured from competitors and users can be locked in.

These examples share ground with other struggles for the control of IT platforms and standards, and for the supernormal profits that come with such control. The web browser wars, highlighted by the long antitrust action

against Microsoft for embedding Internet Explorer into the Windows operating system, have been repeated in the media player arena. Microsoft's integration of its media player into Windows was recently the subject of a successful antitrust action brought by the European Union (2005). The fact that Microsoft continued to fight this issue in the face of hundreds of millions of dollars in fines speaks to the perceived value of platform dominance. Far more than in the browser case, which Microsoft ultimately won but could not commercially exploit, the control of media formats brings with it the prospect of incorporating the vast distribution chains of the content industries into a single revenue stream. It holds the prospect of Microsoft or Apple control of the new fee and service models that DRM and closed architectures make possible.

The *structure of participation* associated with DRM has numerous implications for freedom of expression and other core principles of an open and participatory digital public sphere. Because use of DRM'd commodities and services is circumscribed by voluntary contractual agreements, DRM systems are far less vulnerable to the claim that they undermine free speech rights. The content provider can retain complete control of the good, ensuring that it never circulates in ways detrimental to the owner's interests. This raises serious political concerns as media and economic interests consolidate. Increasingly, the capacity for censorship becomes a precondition of use. Intellectual property law, and in particular the fair use provisions to copyright law that support access to knowledge goods, are made largely irrelevant in this context. The contractual framework is a private one, with no obligation to balance public and private interests and with diminished forms of accountability. DRM signals a postcopyright regime of control over circulation and use, in which the terms of use are set not by public policy but by private interests.

an open ecology

At present, DRM systems operate within an "ecology" of computing and network technologies that is both intensively and extensively diverse. Many different systems and architectures coexist within the same information space—the average U.S. household, according to Novell's estimate from 2002, contains some 145 microprocessors. The vast majority of these systems are not PCs but devices with embedded chips—cell phones, DVD players, home appliances, and so on. Whereas some 150 million PCs were shipped worldwide in 2002, embedded systems accounted for 5.3 billion shipments.[7]

Despite the rollout of wireless services and trends toward "ubiquitous computing," very few of these devices are currently networked. Among other things, this means that the vast majority of vendors exercise no effective control on after-sale use of these systems. They can be hacked, reverse engineered, and cloned; closed commodity chains can be opened by competitors. This familiar characteristic of commodity chains has an important political dimension: In such contexts, it is very difficult to exercise control over the global information ecology. System heterogeneity is reinforced by political heterogeneity, reflecting different national and regional needs and capacities. It is also reinforced by the facts of uneven development, which underwrite the "recycled" or "pirate" modernity described by Ravi Sundaram (Chapter 4) and Brian Larkin (Chapter 5) in this volume, with its patchwork of systems, illicit software, and low-cost computing initiatives.[8] In such environments, complicated vendor–user relationships, structured by ongoing fees, contractual relationships, and postsale monitoring, are unfeasible. In such circumstances, computing infrastructures favor untethered resources—pirated software with broken keys, recycled PCs, and, increasingly, noncommercial products such as Linux, and other open source software.

First-world DRM provides ways of securing particular product channels, but has little impact on what people do with their computers outside those channels or elsewhere on the network. Open system architectures make it very difficult to monopolize formats; heterogeneous computing ecologies make it very difficult to universalize surveillance or compliance with contracts. DRM's potential for controlling content is greatly undermined by this heterogeneity and openness, with its easy-entry/easy-exit conditions of innovation and use. Those who don't like the subscription structure of the reborn Napster, or who become too frustrated with Apple's device certification requirements for songs purchased on iTunes, can fall back on the "uncontrolled" MP3 audio format. At present, the digital cultural economy is mixed—not all sources are known or trusted; not all uses are regulated.

legal closure

Content industries have supported a range of legal innovations in the last decade to reduce this heterogeneity—initially through the World Intellectual Property Organization's Internet treaties (WIPO; 1996), and later in national and regional implementations of WIPO treaty provisions, such as the U.S. DMCA (1998) and the EU Copyright Directive (2001). The most significant

of these measures is the criminalization of attempts to circumvent encryption or other protections attached to digital goods. These anticircumvention clauses extend legal protection beyond the copyrighted work itself into the penumbra of technological methods for limiting access. They have equated circumvention with theft, and in the process have shifted the power to make decisions about what constitutes permissible use from consumers (and when contested, the courts) to the copyright holder. Such measures effectively close off much of the latitude available for the unanticipated uses of digital goods, whether or not those uses infringe the copyright. They also affect a number of basic practices of technology research and development—most directly in the area of encryption, which advances through continuous testing and breaking of encryption algorithms (Litman, 2001; Gillespie, 2004; Brief, 2005).

As in other areas, new tools for controlling the commodity chain also prove to be powerful tools for excluding competition: Manufacturers and content producers can simply encrypt functions or input/output protocols to block the development of compatible devices. The DMCA, in particular, effectively criminalizes reverse engineering except for the narrow purpose of improving interoperability—and then on terms highly favorable to the owner of the encrypted system. Although some of these efforts have been defeated (such as Lexmark's 2004 bid to exclude generic printer cartridges), manufacturers must now be taken to court to secure such freedom to operate, raising the cost of entry for innovators. The DMCA failed, moreover, to provide any specification of personal fair use—giving a nod only to the institutional purposes of libraries and archives, through guidelines subject to periodic reexamination by the Library of Congress.

In practice, the DMCA has been used by the content industries to restrict independent research on existing DRM technologies—including for the purposes of academic research. There have been several high-profile cases of such censorship, such as the 2001 lawsuit brought against Professor Ed Felton of Princeton University, when he sought to document his decryption of the Secure Digital Music Initiative's encryption algorithm *as part of an SDMI-sponsored contest* (see Felton, 2003); or the charges brought against Russian programmer Dmitri Skylarov when he presented his work on Adobe Reader encryption to an American conference audience; or the charges brought against 16-year-old Jon Johanson for writing a seven-line program to strip DVDs of their CSS encryption, so that they could be used

on Linux systems, which have no CSS-licensed media players. In practice, the DMCA works to shield content industry value chains from competition and the innovation processes characteristic of open system ecologies.

trusted computing

Trusted computing (TC) describes a different model of network architecture under development by a range of major hardware and software companies, including Microsoft, Intel, IBM, Hewlett-Packard, and AMD. Although the initiative has had a variety of names and stated goals, most accounts highlight the need to "give individuals and groups of users greater data security, personal privacy and system integrity."[9]

Although project details are often difficult to pin down, TC's core functions are relatively clear: where the PC platform has been open to user modification, a trusted computer will have its status continuously certified by a controlling authority (such as the Trusted Computing Group, comprised of the major players). Certification will depend on the presence of system components that comply with industry requirements for the secure delivery of services. These include all input and output functions at all points of the system, from the graphics and sound card to hard drives and CD burners. Although this will make it more difficult for viruses and other malware to run on a local computer, much of the initiative has focused on preventing the user from making unauthorized use of media content: Trusted status means that no unapproved device or software can capture digital output or even analog output that can be redigitized (the so-called "analog hole" at stake in debates about high-definition television signals and recording devices). All components and peripherals will have to be able to adhere to rules dictated by content providers. Storage of all kinds—hard drives, CD burners, and random-access memory—will be subject to those rules.

The public face of trusted computing usually involves the claim that individuals can opt out—that users will be at liberty to turn off the TC framework and retain the current "freedom to tinker," to use Ed Felton's phrase. In practice, the incentives to work within the trusted environment are likely to be high: Trusted status will be the condition of the delivery of a wide range of services, and could easily be made the condition of more basic forms of communication, such as the receipt of Microsoft Word documents, or Outlook-generated emails. If this seems unlikely, it is worth noting that DRM for both MS Word documents and Outlook email was integrated into Office 2003,

allowing such features as expiration dates, encryption readable only by specific persons, or blocks on forwarding documents or emails outside the home institution. At present, these features need to be supported by a Microsoft network environment. In a trusted system ecology, permissions can be so extensive and interconnected that documents could be restricted wherever the trusted system was in force. Ross Anderson notes the authoritarian undercurrent of these capabilities, which not only enhance the potential for secrecy, but also the possibility of retroactively altering the documentary record. Citing one possible use, "Word documents created on civil servants' PCs [can be] 'born classified' and can't be leaked electronically to journalists" (Anderson, 2003). When documents have trackable identification numbers, a trusted system could erase them, alter them, or simply render them unusable wherever they had circulated. By stemming the viral capacity of the Internet to spread information, document DRM could bring about a dramatic decline in the accountability of private and public institutions. It signals a change, in Geoffrey C. Bowker's (Chapter 2, this volume) terms, in the power relations that define a society's "memory practices."

It should come as no surprise that software piracy is an explicit target of this initiative.[10] The blacklisting of known, pirated software serial numbers is already common practice. Usually, blacklisting doesn't prevent the installation and use of software—pirate hacks often work around the initial validation—but it does restrict the steady flow of patches and updates provided by the vendor.[11] Vendors, in turn, must weigh whether their paying customers are better served by blocking access to security patches for unauthorized users, which in a highly connected environment can make all users less secure. The resulting system leaks on all sides, and more so in the developing world, where the majority (and sometimes the overwhelming majority) of the installed software base is pirated.[12] TC-enhanced control raises the possibility of a broader transformation of this global IT ecology, and in particular of a very different kind of pressure brought to bear on developing countries. Anderson (2003) describes how the developing-world IT infrastructure, characterized by low ability to pay and a high capacity for piracy, could be made to play by Microsoft's rules:

> **For years, Bill Gates has dreamed of finding a way to make the Chinese pay for software: TC looks like being the answer to his prayer. . . . The proposed use for this is that if everyone in China uses the same copy of Office, you do not just stop this copy running on any machine that is TC-compliant; that would just motivate the Chinese**

to use normal PCs instead of TC PCs. You also cause every TC-compliant PC in the world to refuse to read files that have been created using this pirate program.

The dependency relationship between developed and developing countries would make this a very powerful incentive to adopt trusted computing, whether or not it came with new media services. Adoption would occur for different reasons based on economic status: for developed countries, the incentive would be better security and richer media services; for developing countries, it could become access to the communication networks of the developed world.

Although elements of open source software practice could probably survive in a TC environment, the certification requirement would gut one of its core values: the right of anyone to run modified software. Although a TC-compliant Linux is almost certainly technically possible and is reportedly under development by IBM, any significant modifications to such a system would require recertification by the TC authority. User control of the direction of open source projects would be greatly diminished and possibly subject to industry veto.[13] The user-centered development model would be severely constrained, as it would be too costly for a central authority to test and certify thousands of small-scale changes.

Although Microsoft and others can implement some of the TC agenda in software, the real security lies in hardware integration—initially in the form of a chip soldered to the motherboard (sometimes called the "Fritz chip," after retired U.S. Senator and DRM enthusiast Fritz Hollings), which would conduct the authentication and certification process for the machine during the boot process. Versions of hardware authentication have been in use for some time in gaming consoles such as Microsoft's Xbox and Sony's Playstation, ensuring that—for all but skilled hackers—only licensed games can be played (Xbox launched in fall 2001; "mod chips" were available by spring 2002; the security protocol itself was cracked in 2003). In the PC arena this functionality will be complemented by and likely subsumed into the microprocessor itself, which will make modification far more difficult.[14]

To date, TC has flown almost entirely under the public's radar. Some of this reflects difficulties in implementation—the TC agenda has advanced in bits and pieces, rather than as part of a concerted master plan. The low profile also reflects industry concerns about public outcry. Intel learned a lesson in 1999 when it announced that Pentium III microprocessors would henceforth contain a unique identification number, enabling hardware-based

authentication of users. Privacy and civil liberty groups saw this as a direct threat to user anonymity on the Internet, and defended the conception of the Internet as an extension of private space except when explicitly relinquished by the user (as in commercial transactions). The strength of public opposition turned the issue into a significant embarrassment for Intel, which ultimately backed down.

Trusted computing reconceptualizes privacy in ways that make analogies to "real-world" expectations of privacy—and abridgements of it—difficult to assert. Notably, TC implements parts of the wish list of digital privacy advocates, who welcome the added barriers to unauthorized access to data on personal computers. The difficulty is that TC embeds effective power over the definition of privacy into the commercial relationship between individuals and vendors. TC equates security not with anonymity, but with constantly authenticated identity. It thereby runs counter to the strong libertarian strain within computer culture that privileged anonymity is a protection against both malicious individuals and the state. Trusted computing is the fusion of security discourse with property discourse. It builds a transition path away from open networks and system architectures toward an environment capable of supporting much more comprehensive control over information. And it shares with other forms of security discourse recurrent blindness to the implications of certain kinds of security for public discourse and for the forms of accountability necessary to an open society. As the basis for a digitally mediated democratic society, TC represents a very large step into the unknown.

Like the current battles over DRM, trusted computing will probably have a bumpy future. Elements of the architecture are extremely ambitious. Earlier generalized architectures for content control have met with both technological and political difficulties, such as the Secure Digital Music Initiative or recent legislative efforts to reengineer hard drives. It is not clear who the certifying authority will be. But large parts of the TC architecture are already in place. Lagrande was built into Pentium IV chips (2003–2004), although not yet activated. Microsoft's trusted document environment exists on its office network servers. Vista, Microsoft's new version of Windows, makes extensive use of hardware and software monitoring. Congressional action, shaped by content industry lobbying, has been looming for several years, and could result in legislation that mandates steps toward trusted computing on all computers and media-capable devices.[15] Regardless of the short-

term outcomes, TC is a bet on the long term—on the need to secure content delivery channels once and for all. Although there are many proposed flavors of trusted computing, they all share, with other digital technologies of control, the lack of a *necessary* middle ground. The conditions of a little control are also the conditions of a lot. However useful some of the features might be—in developing a fair-use friendly digital circulation model for authors or musicians, for instance—TC places controlling authority in the hands of the corporate intermediaries, who, facing diminished competition, will face less pressure to make generous arrangements for the secondary cultural lives of their goods.

core common infrastructure and digital freedom

One way to strengthen public cultural agency, in this context, is to support a "core common infrastructure" for digital culture that provides low-cost access to basic services and maintains a high degree of openness to different kinds of secondary activities (Benkler, 2001; 2006). In Yochai Benkler's account, core common infrastructures exhibit neutrality toward different users *and* uses: They do not "discriminate" by raising costs for particular kinds of use. Such neutrality is inevitably circumscribed by social and legal definitions of harmful use, but the general principle holds true for many basic forms of infrastructure: The public highways, for example, support many different kinds of traffic at equal cost to the traveler. "Common carrier" regulations have traditionally required private network owners, such as railroads and telecommunications providers, to serve anyone—including competitors—willing to pay a standard price. Competitive markets for services can also respect neutrality toward uses and users—a fact that becomes increasingly important when infrastructure is privately owned. In these diverse but related senses, core common infrastructures are bound up with, and often conceived as prerequisites of, the exercise of multiple kinds of freedom—free speech, freedom of movement, free markets, and, in Lawrence Lessig's addition to this lexicon, free culture—one in which individuals enjoy wide latitude to create and share (Lessig, 2004). In turn, the substantive meaning of freedom, at any particular moment, is inseparable from the characteristics of these networks: Free speech is exercised through the dominant technologies of communication; freedom of movement through the dominant means of transportation; freedom to buy and sell within a marketplace that discriminates neither for nor against certain buyers.

Digital technologies bring their own native characteristics that shape the available forms of cultural participation and notions of freedom. The almost limitless fungibility of digital representation is the most essential of these, with arguably the largest impact on the objects and forms of circulation of public culture. As digital convergence becomes the normal condition of cultural expression, it is easy to lose sight of the underlying shift implied in digital representation. For the first time, the content of culture is easily dissociable from its storage medium—text from paper, moving images from film, sound from records and CDs. Nothing *necessary* anchors a digital representation to a particular device or object. Instead, the characteristics that matter most are those that define the technologies themselves: operations upon data; blurred lines between storing, accessing, and copying; and increasingly fast and cost-free transmission.

These characteristics inform the substantive meaning of a core common infrastructure for digital culture. In particular, they provide an important and, in the current environment, very demanding condition for nondiscrimination: minimal constraints on the use of the basic capabilities of the technologies themselves. This condition is central to several contemporary information and technology policy debates, from the debate about discrimination among services on the Internet signaled by the term "net neutrality," to debates over the availability of unlicensed radio spectrum, which has supported, among other things, the growth of WiFi. The open source/free-software movement has also demonstrated how commitments to open, nondiscriminatory infrastructures can underpin more formal concepts of digital freedom, expressed through rights to examine, modify, and distribute software code, and embedded in participatory values and practices. The industry campaign against file sharers has different objectives, but similarly tests whether file sharing generates its own *informal but substantive* concept of digital cultural freedom, rooted in greatly expanded lower-cost access to media.

Because digital convergence brings together once-distinct modes of expression (textual and audiovisual), as well as different modes of communication—one-to-one (telephony), one-to-many (broadcasting), simultaneous, and asynchronous—the larger cultural field comes to rely increasingly on the constitutive choices made for the underlying infrastructure. One of the main achievements of the current wave of law and technology scholarship has been to articulate the interplay between these technical choices and other more familiar forms of cultural regulation. For Lessig (2002, 2004), law

and technical architectures operate as complementary modalities for shaping our freedoms and notions of cultural agency (together with norms and markets). Benkler (2001), for his part, builds on a traditional three-layer model of network architecture to identify regulatory opportunities for defending social, political, and cultural freedoms: the physical layer, involving the organization of material infrastructures such as fiber optic networks and radio spectrum; the logical layer that structures traffic (such as TCP/IP protocols for the Internet); and the content layer structured by norms of ownership and by intellectual property law.

These schemas map the politics of openness and closure proper to network technologies. They also identify a new context for the construction of democratic cultural values, described partly by the reconfiguration of major political values such as privacy or free speech within emerging digital institutions, and partly by the ways that digital culture has focused political attention on once-minor values, such as sharing, collaboration, and creativity. The digital environment provides a range of native contexts for the growth of these forms of subjectivity and agency. It also creates the conditions for a more extensive lockdown of cultural production than was possible in the analog era, marked by pervasive monitoring, the steering of behavior though design choices, and the strengthening of commodity chains.

As Lessig has observed throughout his work, code is a form of de facto legislation of the digital environment. Part of our problem is that we have done little to subject code to the same public processes or safeguards that the democratic tradition has thought essential to the formulation of law. The outpouring of serious attention that 17th- and 18th-century thinkers gave to the question of constitutions—in recognition of the opening of the political "design space" as the divinely justified social order lost legitimacy—has not been reproduced as we move into an era of new sociotechnical systems. Civil society for the digital age is radically underdeveloped, and the important struggles over values are no longer limited to defining the boundaries between the individual and the state.

Although older versions of public life were no less dependent on technological infrastructures and pathways of information, they were far more constrained by the limits of human cognition, communication, and agency. They cohered in part because of the comparatively slow evolution of those information technologies—print, mail, the telegraph, the telephone—although each of these catalyzed important changes in the organization of

politics and society. The new spaces of digital culture are no less social and political than the old ones they displace, but they are far less visible to the classic citizen of democracy—the person without expert knowledge. A democratic digital culture will be one in which the inevitable conflicts of values in this technical sphere are recognized and adjudicated through public processes. A democratic digital infrastructure will be one that supports participation in those processes.

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notes

1 The key principles of end-to-end networking and its consequences for innovation were developed by Saltzer, Reed, and Clark (1984). A number of scholars have used the end-to-end analogy to describe the organization of a democratic public sphere (e.g., Lessig, 2002; Benkler, 2001, 2006). See also Sack's discussion of the network metaphor in Chapter 11, this volume.

2 IBM's patented MCA bus for PCs (1987) illustrated this tension. IBM's effort to charge licensing fees for access to the bus resulted in the rapid development of an open alternative, the EISA bus, by other hardware manufacturers.

3 Industry-friendly digital music services such as the "new" Napster have struck deals with Pennsylvania State, Yale University, Wake Forest University, Vanderbilt University, and others. Under most of these arrangements, universities privilege or subsidize the music service on campus in return for diminished liability for copyright infringement on campus networks (see, e.g., Borland, 2003).

4 This "super-sharer" structure of the most popular P2P networks is documented and discussed in Free Riding on Gnutella (Adar & Huberman, 2000). They concluded that on the P2P network Gnutella, in 2000, 5% of users were sources for 70% of the transfers. The recent music industry

approach to suing individual users of file-sharing networks is premised not just on the general deterrent effect of highly publicized fines, but on the potential cascading effect of removing the super-sharers.

5 ISP-level filtering is the basis of the "Great Firewall" of China maintained by the Chinese government, which restricts both individual websites and types of speech on the Internet.

6 Lexmark has invoked the Digital Millennium Copyright act against generic cartridge manufacturers who have reverse-engineered its cartridge authentication protocol; on the HP cartridge expiration date, see http://www.ddjembedded.com/resources/articles/2002/0209k/0209k.htm

7 Roughly half of these run neither Windows nor Linux, but a Japanese open source operating system called iTron. See Turkey (2002).

8 From the Indian Simputer, to Brazil's $300 Popular PC, to the more recent One Laptop Per Child initiative, which has targeted a $100 price point.

9 See Microsoft "Palladium" business overview: http://www.microsoft.com/presspass/features/2002/jul02/0724palladiumwp.asp#challenge

10 See TC pioneer Mark Stefik's account of the initiative as grounded in the presumption that "the consumer is dishonest" (Stefik, 1997); also Erikson (2003)

11 The Windows Genuine Advantage program, distributed through Microsoft's automatic security updates to Windows XP, implemented an early version of this surveillance in 2006.

12 Rates of business software piracy, especially, are said to hover around 70-80% in most developing countries—although the industry data and methods have been disputed. For annual summaries of industry country studies, see the International Intellectual Property Alliance site: http://www.iipa.com/countryreports.html

13 For Free Software Foundation Richard Stallman's views on "treacherous computing," see http://www.newsforge.com/business/02/10/21/1449250.shtml?tid=19

14 See, for example, Intel's Lagrande effort, which brings curtained memory, protected input/output, and sealed storage features into the microprocessor (Stam, 2003).

15 See, for example, 2003's CBTBDA act and 2004's wildly broad INDUCE act, which would ban any device that could contribute to copyright infringement.

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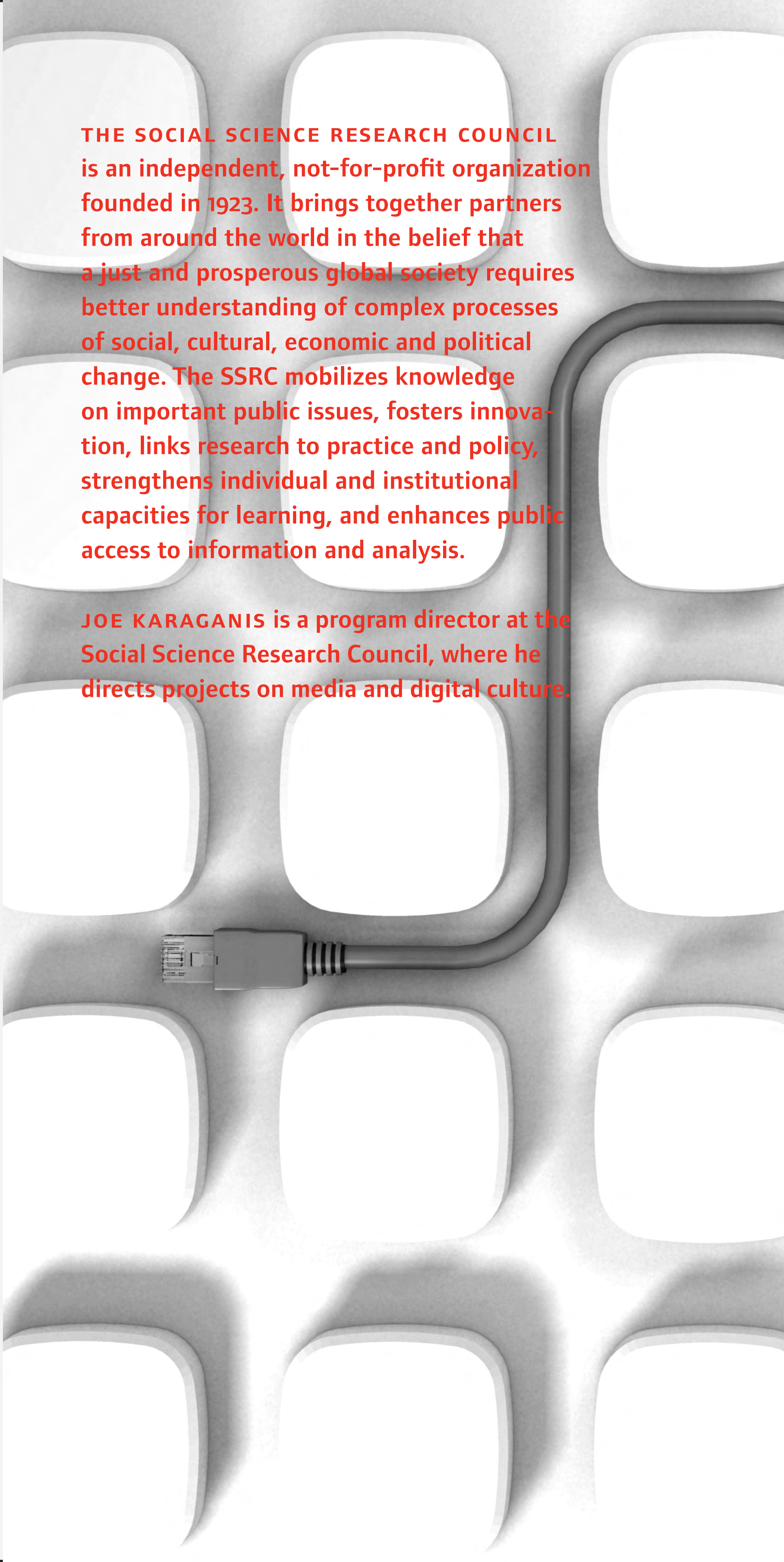
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Digital technologies have been engines of cultural innovation, from the virtualization of group networks and social identities to the digital convergence of textual and audio-visual media. This volume explores how these new capacities transform our shared cultures, our understanding of them, and our capacities to act within them.

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